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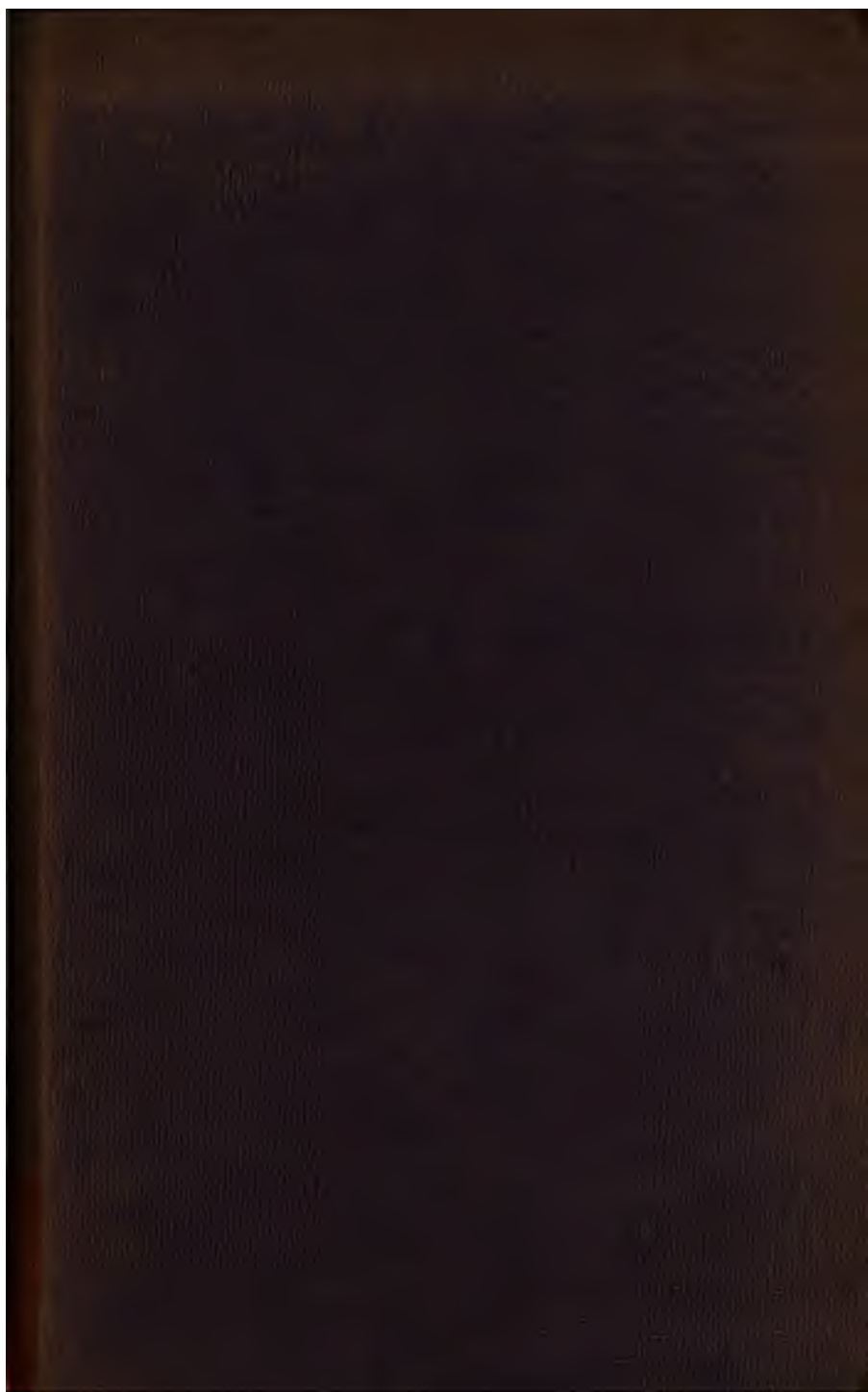
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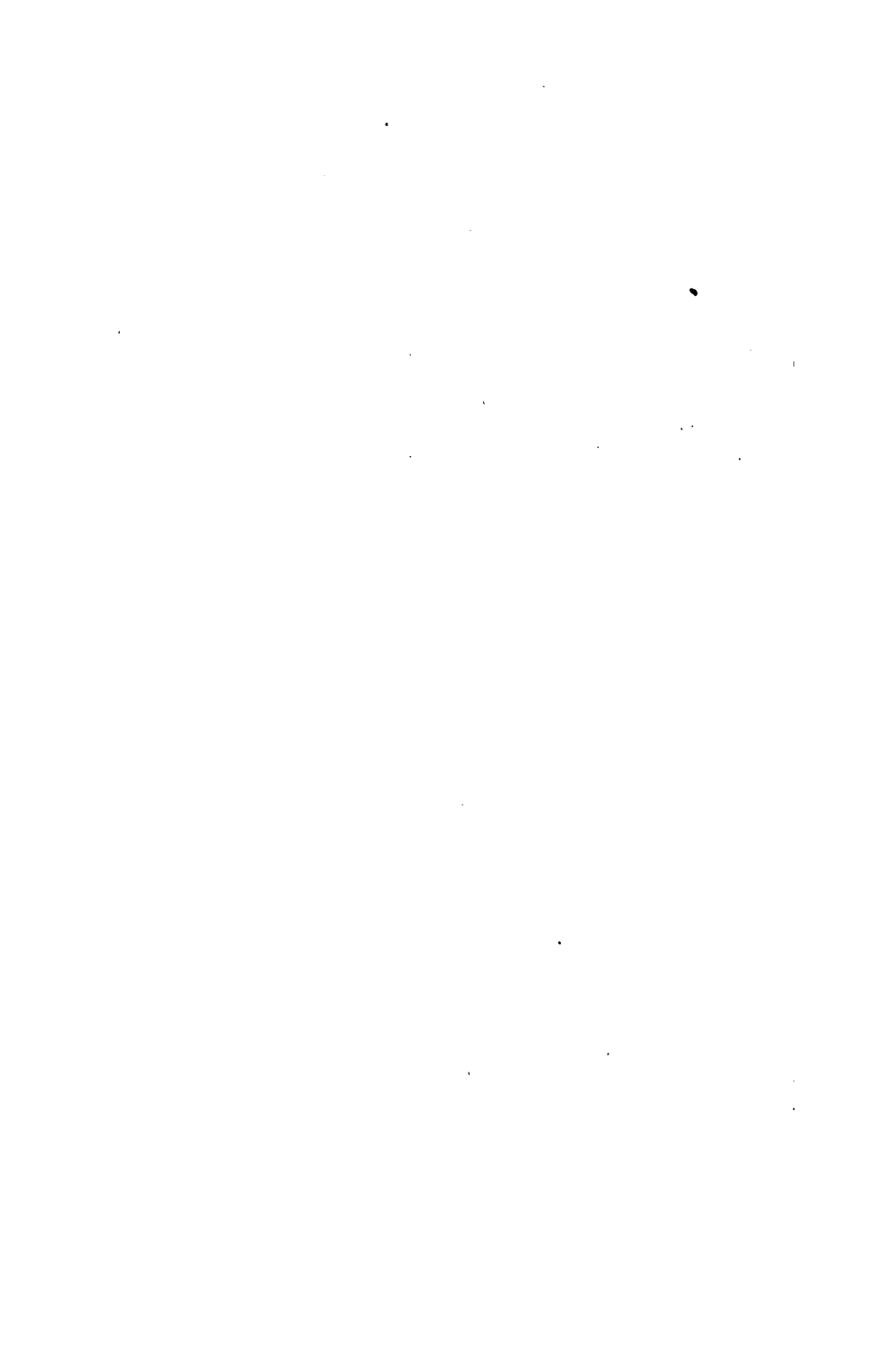
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HUMAN ANATOMY;

FORMING A COMPLETE SERIES OF

QUESTIONS AND ANSWERS

FOR THE USE OF

MEDICAL STUDENTS,

BY

MEREDITH REDMAN,

M.R.C.S., ENGLAND; L.S.A., ETC.

ANSWERS.

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ANSWERS

TO QUESTIONS ON

HUMAN ANATOMY.

SECTION I.—ANATOMY IN GENERAL.

- 1 Anatomy is that Science which teaches us (by Dissection and the aid of the Microscope), the Structure of the human body.
- 2 Physiology is that Science which teaches us the Functions of the human body.
- 3 Pathology explains the alterations in the structure of the body, occasioned by Disease.
- 4 Into Solids and Fluids.
- 5 Bones, Cartilages, Ligaments, Muscles, Tendons, Membranes, Cellular-tissue, Vessels, Nerves, Adipose-tissue, Glands, Hair, Nails, Ducts, &c.
- 6 Bones are the hardest and most inflexible parts of the body and of a whitish colour.
- 7 100lbs. of Adult Human Bones contain about 33 per cent. of animal matter, and 67 of earthy matter, viz.: Phosphate and Carbonate of Lime, Fluoride of Calcium, and Phosphate of Magnesia.
- 8 Cartilages are the white elastic Cellular substances covering the ends of Bones, commonly called "Gristle," and next in hardness to Bone.
- 9 Similar to Cartilages, but with Fibres intervening among the Cells; they exist between the Vertebrae; they also unite the Bones of the Pelvis, &c.
- 10 Not in the natural state.
- 11 Ligaments are short Strata of Fibres connecting the extremities of the moveable Bones, (the Joints).

- 12 Muscles are composed of Fibres arranged parallel to each other; towards their extremities, when in the form of a rounded Cord they are denominated Tendons, and when expanded as Membranes they are called Aponeuroses: *e.g.* the Abdominal Muscles.
- 13 Areolar-tissue is most extensively diffused throughout the body, forming as it were the basis or original structure. It consists of a net-work of minute Fibres intermixed with thin Laminæ or Plates of Membranes, so interwoven with each other as to leave numerous interstices, which during life contain a Serous Fluid.
- 14 It serves to connect together the Muscles. It exists in large quantities between the Muscles and Skin. It forms Sheaths for the Blood Vessels and Nerves. It enters into the structure of all the organs contained in the Trunk, &c.
- 15 It is better supplied with Vessels than the other Fibrous Tissues.
- 16 Vessels consist of three kinds: Arteries, Veins, and Lymphatics.
- 17 The Arteries are Cylindrical Tubes composed of three Coats or Layers, viz.: An external or Cellular Coat, a middle or Fibrous Coat, and an internal or Serous Coat.
- 18 The Veins invariably accompany the Arteries, with the exception of the Superficial Veins; their Coats are the same as the Arteries, but much thinner, and the inner Coat is at certain points reflected, forming "Valves."
- 19 The Lymphatics are small Vessels accompanying the Veins; their Coats are the same as those of the Arteries and Veins, and like the Veins are provided with Valves.
- 20 The Nerves are white flattened Cords, composed of Filaments which are connected with the Brain and Spinal Cord, possessing Motor, Sensory, and Sympathetic Functions, to be hereafter described.
- 21 Adipose-tissue is a Cellular substance within which the Fat is deposited.
- 22 Glands are distinct bodies composed of Blood Vessels, Nerves, and Absorbents, united by Cellular-tissue.
- 23 Blood, Urine, Saliva, Tears, Bile, Gastric-juice, Pancreatic-juice, Milk, Chyle, Mucus, Aqueous Humours of the Eye, &c.

- 24 Blood is the Fluid which circulates throughout the Cavities of the Heart, Arteries, and Veins, and from which all the other Fluids are secreted.
- 25 Urine is the Fluid secreted by the Kidneys and conveyed by the Ureters into the Cavity of the Bladder.
- 26 Water, Urea, Lactic Acid, Lithic Acid, Lactate of Ammonia, Osmazome, Mucus of the Bladder, Sulphates of Potass and Soda, Phosphates of Soda and Ammonia, Phosphates of Lime and Magnesia, Chloride of Sodium, and Muriate of Ammonia.
- 27 Saliva is the Fluid secreted by the Salivary Glands into the Mouth.
- 28 The Parotid, Sub-maxillary, and Sub-lingual Glands.
- 29 A Fluid secreted by the Lachrymal Glands and flowing over the surface of the Eyes.
- 30 A Fluid secreted by the Liver.
- 31 Biliary matter, consists chiefly of Salts formed by the union of Potash, Soda, and Ammonia, with two fatty Acids; Choleic and Choloidic.
- 32 A Fluid secreted by the minute Follicles imbedded in the Walls of the Stomach.
- 33 A Fluid, analogous to the Saliva, secreted by the Pancreas.
- 34 A Fluid secreted by Glands, whose structure is analogous to that of the Parotid Glands, viz.: the Mammary Glands.
- 35 A milk-like Fluid separated during Digestion from the Chyme, and is the Fluid from which the Blood is formed.
- 36 A transparent glutinous Fluid secreted by the Mucous Glands of the Nose, Mouth, &c.
- 37 A Fluid secreted in the Testes.
- 38 An unctuous Fluid secreted by certain Joints, as the Knee, Hip-joint, &c.
- 39 To lubricate the Cartilaginous surfaces of Joints, and facilitate their motion.
- 40 Osteology, Osteogeny, Syndesmology, Chondrology, Myology, Adenology, Splanchnology, Bursalogy, Angeology, and Neurology.
- 41 A description of the Bones.
- 42 The formation and growth of Bones.
- 43 The doctrine of the Ligaments.
- 44 The doctrine of the Cartilages.
- 45 The doctrine of the Muscles.

- 46 The doctrine of the Glands.
- 47 The doctrine of the Viscera.
- 48 The doctrine of the Bursæ Mucosæ.
- 49 A description of the Vessels of the body.
- 50 The doctrine of the Nerves.
- 51 Bursæ Mucosæ, as their name expresses, are Mucous Bags or shut Sacs, analogous in structure to Synovial Membranes, and whose internal surfaces are lubricated by a Synovial Fluid; they exist in the Knee-joint, Elbow-joint, &c.

SECTION II.—THE BONES IN GENERAL.

- 1 The Membrane which invests the external surface of all the Bones, except the Crowns of the Teeth: it is called Pericranium, where it lines the Cranium; Periorbita, in the Orbits; Perichondrium where it covers Cartilage, and Peridesmium when it covers Ligament.
- 2 To strengthen the union of Bones; to afford attachment to Ligaments and Muscles; to conduct and support Vessels in their course to Bones, &c.
- 3 Into three Classes: 1st, the long or Cylindrical Bones; 2nd, the broad or flat, and 3rd, the short mixed or irregular Bones.
- 4 The shaft or middle portion of the Bone, which first Ossifies, is called the Diaphysis, and the other portions which are last Ossified the Epiphysis.
- 5 A process or projection of Bone over a plain surface as the Nasal Apophysis of the Frontal Bone, &c.
- 6 Yes, more especially during Ossification.
- 7 By innumerable Foramina over their external surface.
- 8 By the tinge which they receive, when young animals are fed with madder, as accidentally discovered by Mr. Belchier.
- 9 The Oleaginous Fluid contained in the Medullary Cavities or Cells of the long Cylindrical Bones.
- 10 Foramina, Canals, Sinuses, Notches, Fossæ, Cavities, Heads, Necks, Processes, Spines, Tuberosities, Tubercles, Fissures, &c.
- 11 Little openings perforating the substance of Bones, *e.g.* Infra-orbital Foramen, Stylo-mastoid Foramen, &c.
- 12 Tracts or channels within the substance of Bones. *e.g.* Infra-orbital Canal.
- 13 Cavities or Depressions in Bones, *e.g.* Frontal and Sphenoidal Sinuses.

- 14 Cavities or depressions in the margins of Bones, *e.g.* the greater and lesser Ischiatic Notches of the *Ossa Innominata*, the Ethmoidal Notch, &c.
- 15 Depressions or Cavities on surfaces of Bones, *e.g.* Iliac-fossa, Zygomatic-fossa, &c.
- 16 Smooth shallow depressions on some Bones, *e.g.* the Glenoid Cavity of the Temporal Bone, Scapula, &c.
- 17 The round tops of Bones, as the head of the Humerus, Ulna, Radius, &c.
- 18 The narrow portions of Bones beneath their Heads, as the necks of the Humerus, Radius, Femur, &c.
- 19 Projections or eminences of Bone, *e.g.* the Odontoid process of the 2nd Vertebra, the Olecranon, Coronoid, and Styloid processes of the Ulna, the Mastoid and Styloid processes of the Temporal Bone, &c.
- 20 Long projections of Bones, *e.g.* the anterior-superior and anterior inferior Spines of the Ilium, also the posterior-superior and posterior-inferior Spines of the same Bone.
- 21 Large rough elevations or eminences of Bone, *e.g.* the greater and lesser Tuberosities of the Humerus, Tuberosity of the Ischium, &c.
- 22 Smaller elevations or eminences of Bone, *e.g.* Tubercle of the Radius, Tubercle of a Rib, &c.
- 23 Deep and long depressions, *e.g.* the Sphenoidal or Orbital Fissure, the Glenoid Fissure of the Temporal Bone, &c.

SECTION III.—ARTICULATIONS IN GENERAL.

- 1 The adjustment or connection of Bones with each other, distinguished by Anatomists into three kinds or classes.
- 2 Diarthrosis, Synarthrosis, and Symphysis.
- 3 A moveable connection or Articulation of Bones.
- 4 Enarthrosis, Amphiarthrosis, Arthrodia, Ginglymus, and Trochoides.
- 5 The Ball and Socket Joint, *e.g.* Head of the *Os Femoris* with the *Acetabulum* of the *Os Innominatum*.
- 6 This kind of Articulation partakes both of Diarthrosis and Synarthrosis. It is that adjustment or connection of Bones which admit of an obscure motion as on flat or plain surfaces, *e.g.* the Metacarpal and Metatarsal Bones, &c.
- 7 The reception of the Head of one Bone into the Superficial Cavity of another, *e.g.* the Head of the Humerus with the Glenoid Cavity of the Scapula.

- 8 The hinge-like Joint admitting of flexion and extension, *e.g.* the Knee Joint, the second and third rows of Phalanges, &c.
- 9 That moveable connection of Bones in which one Bone rotates upon another, *e.g.* the first Cervical Vertebra upon the Odontoid process of the second or Axis.
- 10 An immoveable connection of Bones.
- 11 Sutura, Harmonia, and Gomphosis.
- 12 The union of Bones by Dentiform margins, *e.g.* the two Parietal Bones, &c.
- 13 The union of Bones by rough margins, *e.g.* Nasal, Superior Maxillary, and some other Bones of the Face.
- 14 That kind of union in which one Bone is fixed in another, *e.g.* the Teeth in the Alveoli of the Jaws.
- 15 The union of Bones by an intervening body or substance.
- 16 Synchronrosis, Syssarcosis, Syneurosis, and Syndesmosis.
- 17 The union of one Bone with another by an intervening Cartilage, *e.g.* the Vertebrae, Os Pubes, Ribs with the Sternum, &c.
- 18 The union of one Bone with another by an intervening Muscle, *e.g.* the Os Hyoides with the Sternum.
- 19 The union of one Bone with another by an intervening Membrane, *e.g.* the Radius with the Ulna.
- 20 The union of one Bone with another by Ligament, *e.g.* the moveable Joints.

SECTION IV.—OSTEOGENY.

- 1 The formation and growth of Bones.
- 2 By the deposition of Ossific matter either in Membrane or Cartilage.
- 3 The Bones of the Skull-cap, viz.: Frontal, Squamous, and Tympanic parts of the Temporal, the Parietal, &c., which were simply Membranous assuming the appearance of Radii diverging from a centre.
- 4 All the Bones of the Tympanum, and well developed, viz.: Malleus, Incus, Orbiculare, and Stapes.
- 5 The Epiphyses.
- 6 About the eighth year.
- 7 About the period of manhood.

SECTION V.—THE SKULL AND ITS SUTURES.

- 1 Into those forming the Cranium, and those forming the Skeleton of the Face.
- 2 The Diploe is the intermediate cancellous structure which exists between the two tables of the Skull-cap.

- 3 Some of the Cranial Bones consist of two Osseous Tables or Plates separated by the Diploe, the external of which is the thickest.
- 4 Eight.
- 5 Occipital, Frontal, two Temporal, two Parietal, Sphenoid, and Ethmoid.
- 6 Fourteen.
- 7 Two superior Maxillary, two Malar, two Palate, two Lachrymal, two Nasal, two inferior Turbinated, the Vomer, and inferior Maxillary.
- 8 The two Temporal, two Parietal, and the Occipital.
- 9 The Frontal, Ethmoid, and Sphenoid.

SUTURES OF THE SKULL.

- 10 The union of the Bones by Serrated or Dentiform margins.
- 11 Coronal, Sagittal, Frontal, Squamous, Lambdoidal, &c.
- 12 The Coronal Suture connects the two Parietal Bones with the Frontal, hence called Fronto-parietal Suture; it extends across the superior part of the Skull, from the great wing of the Sphenoid Bone on one side to its fellow on the opposite side.
- 13 The Sagittal or Inter-parietal Suture extends from the centre of the Coronal Suture along the middle line to the Occipital Bone.
- 14 The Frontal Suture extends from the centre of the Coronal Suture down the middle line of the Forehead to the root of the Nose.
- 15 The Squamous Suture is placed laterally over each external Meatus of the Ear; it connects the Squamous portion of the Temporal Bone with the Parietal; also the greater wing of the Sphenoid with the Temporal, by the Squamo-sphenoidal Suture.
- 16 The Lambdoidal or Occipito-parietal Suture unites the Occipital Bone to the two Parietal Bones.

SECTION VI.—BONES OF THE SKULL.

OCCIPITAL BONE.

- 1 The Occipital Bone contributes to form a part of the base and posterior part of the Cranium.
- 2 Trapezoid.
- 3 Into two surfaces: external or Occipital, and internal or Cerebral; four borders and four angles.
- 4 Convex.
- 5 The Occipital protuberance.
- 6 The superior curved line.
- 7 From the lateral Angle to the other.

- 8 The inferior curved line.
- 9 The Crest or Spine.
- 10 Oval, and transmits the Medulla Spinalis, or Spinal Cord and its Membranes; the two Vertebral Arteries, and the two Spinal Accessory Nerves.
- 11 The Condyle.
- 12 The Atlas.
- 13 The anterior Condylloid Foramen.
- 14 The Hypo-glossal or great Motor Nerve of the Tongue.
- 15 The posterior Condylloid Foramen.
- 16 A small Vein to the Lateral Sinus.
- 17 The Basilar process.
- 18 The insertion of the superior Constrictor of the Pharynx.
- 19 The Rectus Anticus Capitis Major et Minor.
- 20 The Jugular Eminence which gives insertion by its under rough surface to the Rectus Capitis Lateralis.
- 21 The Check Ligaments.
- 22 The Jugular Fossa, which lodges the commencement of the internal Jugular Vein, and which with a corresponding part of the Occipital Bone forms the Foramen Lacerum Posterius.
- 23 Concave, and presents two thick ridges, one vertical the other transverse, and both marked by grooves.
- 24 The superior Longitudinal Sinus, above the crossing and the Basilar Sinus below it.
- 25 The Lateral Sinus on either side.
- 26 The Falx-cerebri above the crossing and the Falx Cerebelli below it.
- 27 The Tentorium Cerebelli.
- 28 The internal Occipital protuberance.
- 29 Six: the two Lateral, one and sometimes two Basilar, the superior Longitudinal, and the Straight.
- 30 Torcular Herophhili.
- 31 Into four Fossæ: the two upper corresponding to the posterior Lobes of the Brain, and the two inferior to the lateral Lobes of the Cerebellum.
- 32 Dentated, and assist to form the Lambdoidal Suture.
- 33 Rough and is divided on either side by the Jugular Eminence.
- 34 The superior, inferior, and two lateral.
- 35 In the interval formed by the union of the posterior and superior angles of the two Parietal Bones.
- 36 This is formed by the Articular extremity of the Basilar process.

- 37 They correspond on either side with the interval formed by the union of the posterior and inferior angle of the Parietal Bone with the Mastoid part of the Temporal Bone.
- 38 Six: two Temporal, two Parietal, Sphenoid, and Atlas.
- 39 Thirteen pairs: Occipito-frontalis, Trapezius, Sternomastoid, Splenius Capitis, Complexus, Rectus Posticus Major et Minor, Obliquus superior, Rectus Lateralis, Rectus Anticus Major et Minor, and the superior and middle Constrictors of the Pharynx.
- 40 Four: two lateral or Condylod portions, one for the Basilar process, and one for the posterior or expanded portion.
- 41 The origin of the Trapezius and Occipito-frontalis Muscles.
- 42 The Sterno-cleido-mastoidens and Splenius Capitis.
- 43 The Complexus.
- 44 From within outwards the Rectus Capitis Posticus Minor et Major, and Obliquus Superior.

FRONTAL BONE.

- 45 The Frontal Bone, as its name implies, is situated at the anterior part of the Cranium.
- 46 Into two parts: a Frontal and an Orbito-nasal.
- 47 At the anterior-superior part of the Skull, forming three-fourths of the extent of the Bone.
- 48 Into surfaces, borders, and processes.
- 49 Convex, and presents on either side a projection called the Frontal Eminence.
- 50 The Superciliary ridges.
- 51 The inner.
- 52 The Supra-orbital ridges.
- 53 In processes, the external and internal angular processes.
- 54 The Supra-orbital Notch: it is sometimes converted into a Foramen, and called the Supra-orbital Foramen.
- 55 The Supra-orbital division of the Frontal Nerve, and the Supra-orbital Branch of the Ophthalmic Artery.
- 56 The Nasal Spine or Tuberosity.
- 57 The Temporal Ridge.
- 58 The Temporal Fossa.
- 59 Concave, and marked by the Convulsions of the Brain; also grooved by the anterior and middle Meningeal Arteries.
- 60 The superior Longitudinal Sinus.

- 61 A small hole improperly called Foramen Cæcum, as it gives passage to a small Vein from the Nasal Fossæ into the Longitudinal Sinus.
- 62 A Fold of the Dura Mater, the Falx Cerebri, which here divides the Hemispheres of the Brain.
- 63 The Glandulæ Pacchioni.
- 64 A wide excavation called the Ethmoidal Notch, which lodges within it the Cribriform Plate of the Ethmoid Bone.
- 65 These Plates, which extend horizontally backwards, are smooth and concave at their under surface forming the roof of the Orbit, whilst the upper or Cerebral surfaces are convex, and marked by elevations and depressions called Digital Fossæ, which correspond with the Sulci and Convolutions of the anterior Lobes of the Brain.
- 66 By the external and internal Angular Processes.
- 67 To the Malar Bone.
- 68 To the Nasal Process of the superior Maxillary Bone, and the Nasal Bone.
- 69 Thick and serrated.
- 70 Thin, and irregular, and articulates with the Sphenoid Bone.
- 71 The Orbital Plates are the thinnest and the Nasal and external Angular Processes, the thickest.
- 72 That space or interval which exists in Adult age between the two Tables of the Frontal Bone and divided by a ridge of Bone into two Cellular Cavities.
- 73 The Lachrymal Gland.
- 74 The Cartilaginous Pulley of the superior Oblique Muscle.
- 75 Nine: the Optic, Spheno-maxillary, and Sphenoidal Fissures, Supra and Infra-orbital Canals, anterior and posterior Ethmoidal Foramina, Temporo-Malar Foramina, and Nasal Duct.
- 76 Optic Nerve and Ophthalmic Artery.
- 77 Spheno-maxillary Nerve and Artery.
- 78 The third, fourth, and sixth Nerves; the first Branch or Ophthalmic division of the fifth, and the Ophthalmic Vein.
- 79 The Supra-orbital or Frontal Nerve and Artery.
- 80 The Infra-orbital Nerve and Artery.
- 81 The Nasal Nerve and anterior Ethmoidal Artery.
- 82 The posterior Ethmoidal Artery and Vein.
- 83 Filaments of the Orbital Branch of the superior Maxillary Nerve.

- 84 Above by the Orbital Plates of the Frontal Bone, and portion of the lesser Wings of the Sphenoid; below by the Orbital Processes of the superior Maxillary and Palate Bones, externally by the Orbital Processes of the Malar and greater Wings of the Sphenoid Bones and internally by the Lachrymal, Ossa Plana of the Ethmoid, and a portion of the body of the Sphenoid Bones.
- 85 Twelve: two Parietal, two Malar, two Nasal, two Ossa Unguis vel Lachrymal, the Sphenoid, Ethmoid, and the two superior Maxillary Bones.
- 86 Four pairs: the Occipito-frontalis, Corrugator Supercilli, a part of the Temporal and part of the Obicularis Palpabræ vel Oculi on either side.
- 87 The inner part of the Superciliary ridge.
- 88 Two: corresponding to the Frontal Eminences.

TEMPORAL BONES.

- 89 Two.
- 90 The Temporal Bone occupies the side and base of the Skull.
- 91 Into three parts: a Squamous, Mastoid, and Petrous portion.
- 92 This portion forms part of the Wall of the Temple.
- 93 Smooth and gives origin to the Temporal Muscle.
- 94 The Zygoma.
- 95 An Arch: the Zygomatic Arch.
- 96 Convex; the inner, concave.
- 97 Concave.
- 98 The Glenoid Cavity.
- 99 Two roots, an anterior and a posterior.
- 100 The Glenoid Cavity.
- 101 The anterior; its course is horizontally inwards, and forms the front boundary of the Cavity, and from the circumstance of its forming a rounded eminence is called Eminentia Articularis.
- 102 This root, called also the Supra-mastoid ridge, forms the upper boundary of the cavity.
- 103 It terminates somewhat abruptly at a narrow fissure which separates the Squamous from the Mastoid portions of the Bone; this fissure is called Fissura Glasseri.
- 104 The Tendon of the Laxator Tympani Muscle.
- 105 The Temporal Fascia or Aponeurosis.
- 106 The Masseter Muscle.

- 107 Behind the ear, forming its posterior part, and by being prolonged downwards forms the Mastoid Process.
- 108 The Meatus Auditorius Externus, which is surrounded by a rough surface called the Tympanic or Auditory Process.
- 109 The Tympanum.
- 110 The middle part.
- 111 Unlike the Squamous portion it is rough and pierced by small Foramina, for the passage of Arteries and Veins.
- 112 The Mastoid Foramen; it gives passage to a Vein from the exterior of the Head which opens into the Lateral Sinus.
- 113 The Digastric Fossa which gives origin to part of the Digastric Muscle.
- 114 The Occipital groove which lodges the Occipital Artery.
- 115 Serrated; corresponding to a portion of the Parietal and Occipital Bones.
- 116 This groove, which curves forwards and inwards, supports part of the lateral Sinus.
- 117 The inner opening of the Mastoid Foramen.
- 118 The Petrous portion passes horizontally forwards and inwards into the base of the Skull, and contains the organ of hearing.
- 119 That of a three-sided pyramid with the apex directed forwards and inwards.
- 120 Into three surfaces (anterior, posterior, and inferior), a base and an apex.
- 121 Part of the Fossa for the lodgment of the middle Lobe of the Brain.
- 122 By the superior or perpendicular semi-circular Canal.
- 123 The Hiatus Fallopii which leads to the aqueduct of Fallopius.
- 124 The small superficial Petrosal Branch of the Tympanic Nerve or Nerve of Jacobson.
- 125 The large superficial Petrosal Nerve.
- 126 The Gasserian Ganglion.
- 127 The Tensor Tympani Muscle.
- 128 The Eustachian Tube.
- 129 A thin partition or Lamella of Bone called Processus Cochleariformis.
- 130 Part of the posterior Fossa of the base of the Skull.
- 131 The large aperture which leads to a short Canal, viz.: the Meatus Auditorius Internus, which passes horizontally outwards.

- 132 The seventh pair of Nerves.
- 133 A vertical ridge of Bone which divides it into two unequal parts, a superior and inferior.
- 134 The commencement of the Aqueduct of Fallopius.
- 135 The Facial Nerve, (Portio Dura).
- 136 At the Stylo-mastoid Foramen, where the same Nerve makes its exit, and where a small Artery the Stylo-mastoid is admitted to the Tympanum. It (the Aqueduct of Fallopius) also receives the Vidian Nerve through the medium of the Hiatus Fallopii.
- 137 Several minute Foramina through which the Filaments of the Auditory Nerve, (the Vestibular), reach the internal Ear.
- 138 Aquæductus Vestibuli vel Canalis Cotunnii.
- 139 A small Artery and Vein, also a small portion of the Dura Mater.
- 140 A Conical Pit or Fossa which forms a minute Canal, called Aquæductus Cochleæ, for the passage of small Vessels.
- 141 Rough and irregular.
- 142 The Styloid process.
- 143 Downwards and forwards and about one inch in length, (the one before me is one inch and a-half,) it gives attachment to two Ligaments, (the Stylo-hyoid and Stylo-maxillary Ligaments), and the origins of three Muscles.
- 144 Stylo-pharyngeus, Stylo-hyoideus, and Stylo-glossus.
- 145 A rough sheath-like indentation or ridge, called the Vaginal process.
- 146 It is the continuation of the Lamella of Bone which forms the back part of the Glenoid Cavity.
- 147 The Stylo-mastoid Foramen.
- 148 The Jugular Fossa.
- 149 The Foramen Lacerum Posterius.
- 150 The internal Jugular Vein.
- 151 The Carotid Canal, which transmits the internal Carotid Artery into the Skull.
- 152 At the Apex.
- 153 The origins of the Tensor Tympani and Levator Palati.
- 154 The Tympanic Branch of the Glosso-pharyngeal or Jacobson's Nerve.
- 155 A Branch of the Par-vagus, (Arnold's Nerve).
- 156 The Apex, and called Foramen Lacerum Medium.
- 157 The Tentorium Cerebelli.

- 158 The superior Petrosal Sinus which communicates with the cavernous and lateral Sinuses.
- 159 Five: Parietal, Occipital, Sphenoid, Malar, and inferior Maxillary.
- 160 Fourteen: Temporal, Occipito-frontalis, Sterno-mastoid, Digastric, Retrahens-aurem, Trachelo-mastoid, Splenius Capitis, Stylo-pharyngeus, Stylo-hyoideus, Stylo-glossus, Tensor Tympani, Levator Tympani, Stapedius, and the Masseter.
- 161 Five: the Squamous, Mastoid, Petrous, Styloid Process, and the Tympanic or Auditory Process.
- 162 Two. PARIETAL BONES.
- 163 At the superior and lateral parts of the Skull, forming with its fellow of the opposite side the principal part of its roof.
- 164 Into two surfaces (external and internal), four borders and four angles.
- 165 Convex, and presents near the centre of the Bone the Parietal Eminence.
- 166 The Temporal Ridge, which gives attachment to the Temporal Aponeurosis or Fascia.
- 167 Part of the Temporal Fossa, which gives origin to the Temporal Muscle.
- 168 Depressions corresponding to the convolutions of the Brain, also lines or grooves for the Branches or Ramifications of the middle Meningeal Artery, also the Parietal Fossa.
- 169 Its fellow of the opposite side.
- 170 The Temporal Bone.
- 171 The Frontal Bone.
- 172 The Occipital Bone: also with the Sphenoid by the Spheno-parietal Suture.
- 173 Anterior-superior, anterior-inferior, posterior-superior, and posterior-inferior.
- 174 The Trunk of the Arteria Meningea Media.
- 175 The superior Longitudinal Sinus.
- 176 At the posterior part near to the Sagittal Suture.
- 177 A small Vein from the exterior of the Skull into the Longitudinal Sinus.
- 178 Glandulæ Pacchioni, they occur chiefly in Skulls of advanced life.
- 179 Five.
- 180 Only one: the Temporal.

- 181 Only one, corresponding with the Parietal Eminence.
SPHENOID BONE.
- 182 It is placed horizontally at the base of the Skull, being connected with all the Bones of the Cranium, and several of those of the Face.
- 183 Into a Body, Wings and Processes.
- 184 That central part of the Bone from which are projected the Wings and Processes.
- 185 Into four surfaces: a superior or Cerebral, an inferior, an anterior and a posterior.
- 186 The Pituitary Fossa or Sella-turcica.
- 187 The Pituitary Gland and Circular Sinus; the latter surrounding the former.
- 188 The Olivary Process.
- 189 To support the Commissure of the Optic Nerves.
- 190 Outwards and forwards.
- 191 The Optic Nerves and Ophthalmic Arteries.
- 192 The two anterior Clinoid Processes, which constitute the inner terminations of the lesser Wings.
- 193 The posterior Clinoid Processes.
- 194 The internal Carotid Artery, Cavernous Sinus, also the Sixth Nerve.
- 195 Part of the inner Wall of the Orbit.
- 196 Two small fissures which are converted into Canals by the Vomer, and called the Pterygo-palatine Canals.
- 197 A very small Artery of the same name, derived from the internal Maxillary Artery.
- 198 The Vaginal Processes between which slide the thin edge of the Vomer.
- 199 A vertical Plate of Bone called the Rostrum.
- 200 Anteriorly with the perpendicular Plate of the Ethmoid Bone and below with the Vomer.
- 201 On either side the Rostrum.
- 202 Sphenoidal spongy Bones, (Cornua Sphenoidalia).
- 203 Flat and rough, and connected in young subjects by Cartilage and in Adults by Bone with the Basilar Process of the Occipital Bone.
- 204 Two thin triangular Processes which project, one on either side, transversely from the upper part of the Body and terminating in an acute point.
- 205 Flat and smooth, and support the anterior Lobes of the Brain.
- 206 Overhang the Sphenoidal fissure, and form the back part of the roof of the Orbit, on either side.

- 207 The Optic Foramen.
- 208 Three surfaces: a superior or Cerebral, an anterior and an external surface.
- 209 This surface which is concave forms part of the middle Fossa of the base of the Skull.
- 210 This smooth surface forms about one half of the outer Wall of the Orbit.
- 211 This surface is divided into two parts by the Pterygoid Ridge; the superior and larger part forms part of the Temporal Fossa, and the inferior forms part of the Zygomatic Fossa.
- 212 Part of the origin of the Pterygoideus Externus Muscle.
- 213 The Spinous Process.
- 214 Into the angle between the Squamous and Petrous portions of the Temporal Bone.
- 215 The external Muscle of the Malleus, viz.: Laxator Tympani.
- 216 The Sphenoidal Fissure.
- 217 This fissure sometimes called Foramen Lacerum Orbitale, transmits the third, fourth, and sixth Nerves, the Ophthalmic division of the fifth, and the Ophthalmic Vein.
- 218 Below the inner end of the Sphenoidal Fissure, and transmits the second division of the fifth pair, viz.: the superior Maxillary Nerve.
- 219 At the base of each Spinous Process, and transmits the last division of the fifth pair, viz.: the inferior Maxillary Nerve, it sometimes transmits the Nervus Petrosus Superficialis Minor, and a small Meningeal Artery.
- 220 Near the apex of each Spinous Process, and transmits the middle Meningeal Artery.
- 221 Perpendicularly from the base of the greater Wings.
- 222 The lateral boundaries of the posterior Nares.
- 223 Into two plates, an external one and an internal one.
- 224 By its outer surface to part of the origin of the external Pterygoid Muscle.
- 225 In a curved hook, termed the Hamular Process, which forms a Pulley around which the Tendon of the Circumflexus vel Tensor Palati plays.
- 226 The Pterygoid Fossa.
- 227 The origin of the internal Pterygoid Muscle.
- 228 The Scaphoid Fossa.
- 229 The origin of the Tensor Palati Muscle.
- 230 An angular Notch called the Palatine Notch.

- 231 Because it receives the Tuberosity of the Palate Bone.
 232 The Pterygoid or Vidian Canal.
 233 The Vidian Nerve and Artery; the former derived from Meckel's Ganglion, and the latter from the internal Maxillary Artery.
 234 Twelve: viz. all the Bones of the Cranium, and five of the Face, the two Malar, two Palate, and the Vomer.
 235 Twelve pairs: the four Recti, Obliquus Superior, Levator Palpebræ, Temporal, external and internal Pterygoid, superior Constrictor of the Pharynx, Tensor Palati, and Laxator Tympani.
 236 Twelve: one for each Wing and Process, four for the Body, and two for the Sphenoidal Spongy Bones, (Cornua Sphenoidalialia).

ETHMOID BONE.

- 237 In the space between the two Orbital Plates of the Frontal Bone at the root of the Nose.
 238 Into a horizontal Plate, a central perpendicular Plate, and two lateral masses.
 239 Part of the base of the Skull and supports the Bulb of the Olfactory Nerve.
 240 Filaments of the Olfactory Nerve, also the Nasal Branch of the Ophthalmic Nerve by a slit or an Aperture at the front of the Cribriform Plate.
 241 This Plate which descends from the Cribriform Plate assists in forming the Septum Nasi.
 242 The Crista Galli which gives attachment to the Falx Cerebri.
 243 The Rostrum of the Sphenoid and the Vomer.
 244 The Nasal Tuberosity of the Frontal and the Crest of the two Nasal Bones.
 245 A number of irregular cavities or Air Cells which are divided by a thin Lamella or partition into two sets; the anterior and posterior Ethmoidal Cells.
 246 By a smooth Plate of Bone called the Os Planum.
 247 They communicate with the Frontal Cells and open by means of a tubular-shaped Canal, the Infundibulum, into the middle Meatus.
 248 Into the superior Meatus.
 249 Part of the external Wall of the corresponding Nasal Fossa.
 250 Thirteen Bones: two Cranial, (Frontal & Sphenoid), two Nasal, two Lachrymal, two Palate, two superior Maxillary, two inferior Turbinated Bones and the Vomer.

251 None.

252 Three: each lateral mass and the perpendicular Plate.

BONES OF THE FACE.

Superior Maxillary Bones.

- 1 Two.
- 2 Anteriorly, forming the greater portion of the Face.
- 3 The upper Jaw and enters into the formation of the Orbit, Nose, Cheek, and Palate.
- 4 Into a Body and four Processes, Alveolar, Palatine, Nasal, and Malar.
- 5 Four: an external or Facial, an internal or Nasal, a superior or Orbital, and a posterior or Zygomatic surface.
- 6 The anterior Wall of the Antrum.
- 7 The Canine Fossa.
- 8 The origins of the Compressor Naris and Levator Anguli Oris.
- 9 The Infra-orbital Foramen which is the termination of the Infra-orbital Canal.
- 10 The Levator Labii Superioris.
- 11 The superior Maxillary Nerve, and the Infra-orbital Artery, the latter one of the terminal Branches of the internal Maxillary Artery.
- 12 The Orifice of the Antrum.
- 13 The upper part.
- 14 Almost triangular, (Antrum of Highmore).
- 15 The slanting floor of the Orbit.
- 16 A Notch or Groove indicating the commencement of the Infra-orbital Canal.
- 17 Below the edge of the Orbit.
- 18 This convex surface forms part of the Zygomatic Fossa.
- 19 Canals (dental), for the transmission of the posterior Dental Nerves, and Branches of the posterior or superior Dental Artery, the former derived from the superior Maxillary Nerve, and the latter from the internal Maxillary Artery.
- 20 The Alveolar, which is deeply excavated for the reception of the Teeth.
- 21 Two Incisors, one Canine, two Bicuspid, and three Molars.
- 22 That which receives the Canine Tooth.
- 23 This strong process projects horizontally inwards.
- 24 Superiorly the Floor of the Nares, and inferiorly (its anterior two thirds), the Arch of the Palate.
- 25 A groove for the reception of the Vomer.

- 26 The Incisive Foramen.
- 27 The anterior or Naso-palatine Canal, which divides into four openings; two of which transmit the anterior Palatine Nerves, which are derived from Meckel's Ganglion, and the other two transmit the Palatine or Nasal Branches of the internal Maxillary Artery.
- 28 Immediately behind the middle Incisor Teeth.
- 29 This Process ascends almost perpendicularly, and forms the lateral boundary of the Nose, and partly the inner margin of the Orbit.
- 30 The Frontal and Nasal.
- 31 The Lachrymal groove.
- 32 By a corresponding groove in the Lachrymal Bone and a small portion of the inferior spongy Bone.
- 33 For the lodgment of the Lachrymal Sac and Nasal Duct which direct the flow of Tears into the inferior Meatus.
- 34 About that of a goose-quill, its direction is downwards and a little backwards.
- 35 Near to the inner margin of the Orbit it gives origin to the Orbicularis Palpebræ, (also the Tendo Oculi or Tarsal Ligament), and immediately in front of the the last-named Muscle, to the origin of the Levator Labii Superioris Alæque Nasi.
- 36 The inferior and middle spongy Bones.
- 37 Part of the inferior and middle Meatuses of the Nose.
- 38 By the union of the anterior crescent-shaped margins of the two Nasal Processes, these margins give attachment to the lateral Cartilages.
- 39 This irregular looking Process is situated on the outer side of the Antrum, over the first and second Molar Teeth.
- 40 The Malar Bone.
- 41 Nine: two Cranial Bones (Frontal and Ethmoid), Malar, Nasal, Lachrymal, Vomer, inferior Spongy, Palate, and its fellow of the opposite side.
- 42 Buccinator, Depressor Labii Superioris et Alæ Nasi, Levator Anguli Oris, Compressor Nasi, Levator Labii Superioris, Orbicularis Palpebræ, Obliquus inferior Oculi, Levator Labii Superioris et Alæ Nasi, and the Masseter.
- 43 From several: one for the Body, one for the Malar, Nasal, and Palate Process, and one and sometimes two for the Alveolar Process.

MALAR BONES.

- 44 Two.
- 45 This Bone, which forms the prominence of the Cheek, is divided into three surfaces; anterior, posterior, and superior.
- 46 Smooth and convex, and gives origin to the Zygomaticus Major et Minor Muscles.
- 47 Several small Foramina, (one larger than the rest), which transmit Branches of the Temporo-Malar Nerve and minute Arteries.
- 48 Concave, and forms the anterior boundary of the Zygomatic Fossa.
- 49 Part of the outer border or margin of the Orbit, and a small portion of its Orbital Floor.
- 50 Three.
- 51 The origin of the Masseter, (from the anterior two-thirds of the Arch).
- 52 Four; three Cranial, (Frontal, Temporal, and Sphenoid), and the superior Maxillary Bone.
- 53 The Levator Labii Superioris, Zygomatici, (Major et Minor), Orbicularis Palpebrarum, Temporal and Masseter.
- 54 From only a single Ossific point.

LACHRYMAL BONES.

- 55 Two.
- 56 At the anterior and inner Wall or angle of the Orbit.
- 57 Into two surfaces (external and internal), and four borders.
- 58 This surface which is smooth, is divided into two parts by a vertical ridge, the inner part assists to form a portion of the Wall of the Orbit, and the other or anterior part lodges the Lachrymal Sac.
- 59 The origin of the Tensor Tarsi.
- 60 This rough surface assists to form part of the middle Meatus anteriorly, and completes the anterior Ethmoidal Cells posteriorly.
- 61 Four Articulations: superior, inferior, anterior, and posterior.
- 62 Superiorly by Suture with the Orbital Process of the Frontal Bone, anteriorly with the superior Maxillary Bone, inferiorly with the inferior Turbinate Bone, and posteriorly with the Os Planum of the Ethmoid Bone.
- 63 Only one: the Tensor Tarsi.
- 64 From only one Ossific point.

NASAL BONES.

- 65 Two.
- 66 Below the Frontal Bone and between the Ascending or Nasal Processes of the superior Maxillary Bones.
- 67 Into two surfaces (anterior and posterior), and four borders.
- 68 Convex laterally and concave longitudinally, and presents two or three Vascular Foramina.
- 69 Concave, and marked by a groove for the passage of the Nasal Branch of the Ophthalmic.
- 70 Four articulations: superior, inferior, external, and internal.
- 71 Superiorly with the Frontal Bone, the perpendicular Plate of the Ethmoid, externally with the ascending or Nasal Process of the superior Maxillary Bone, and internally by the Nasal Suture with its fellow of the opposite side, and in the recent subject it is connected inferiorly with the Nasal Cartilages.
- 72 Superiorly by the Nasal Ethmoid and Sphenoid Bones, inferiorly by the Palatal Processes of the superior Maxillary and Palate Bones externally by the superior Maxillary, Palate, Lachrymal, inferior spongy, Ethmoid and internal Pterygoid Plate of the Sphenoid Bone, and internally by the same Bones as the external boundary.
- 73 The Vomer and perpendicular Plate of the Ethmoid Bone.
- 74 None: the Pyramidalis Nasi and Compressor Naris are merely in relation with it.
- 75 From only one Ossific point.

PALATE BONES.

- 76 Two.
- 77 At the posterior part of the Nares between the Pterygoid Processes of the Sphenoid and the superior Maxillary Bones.
- 78 Like the letter L, and divided into a horizontal Plate, a perpendicular Plate, and a Tuberosity.
- 79 The horizontal Plate which assists to form its inferior surface.
- 80 A transverse Ridge to which is attached the Aponeurosis of the Circumflexus Palati.
- 81 The posterior Palatine Canal which transmits the posterior Palatine Nerve and Artery.
- 82 This Edge which is slightly Serrated, articulates with the Palatal Process of the superior Maxillary Bone.
- 83 This concave Edge gives attachment to the soft Palate.

- 84 In an acute point which with its fellow of the opposite side, forms the posterior Palatal Spine.
- 85 The origin of the Azygos Uvulæ.
- 86 Part of the Floor of the Naris.
- 87 Part of the external Wall of the Nasal Fossa by its internal surface.
- 88 The inferior spongy Bone.
- 89 The inferior and middle Meatuses.
- 90 The Spheno-maxillary Fossa.
- 91 The posterior Palatine Canal.
- 92 By the Tuberosity of the superior Maxillary Bone.
- 93 The Anterior or Orbital and the posterior or Sphenoidal Processes.
- 94 The Spheno-palatine Foramen which leads from the Spheno-maxillary Fossa into the Nasal Cavity.
- 95 The Spheno-palatine Nerves and Artery, the former derived from the superior Maxillary Nerve, and the latter from the internal Maxillary Artery.
- 96 Air.
- 97 Five: three articular and two free, viz., superior, external, internal, posterior, and anterior.
- 98 Posterior, connected with the body of the Sphenoid Bone; anterior, with the superior Maxillary Bone, and the internal with the Ethmoid Bone.
- 99 The superior or Orbital, forms the back part of the Floor of the Orbit, and the external looks into the Spheno-maxillary Fossa.
- 100 This thin Lamella of Bone arches inwards, and forms part of the Roof of the Nasal Fossa.
- 101 Three surfaces, a superior or convex surface, and two lateral surfaces.
- 102 The under part of the Body of the Sphenoid Bone.
- 103 The Spheno-maxillary Fossa.
- 104 The lateral boundary of the Nasal Fossa.
- 105 This thick strong Process is situated at the Angle formed by the horizontal and perpendicular Plates of the Bone, and is received into the angular Notch between the two Plates of the Pterygoid Process of the Sphenoid Bone.
- 106 Three; posterior, anterior, and inferior.
- 107 A smooth depression which completes the Pterygoid Fossa.
- 108 A rough surface which articulates with the Tuberosity of the superior Maxillary Bone.

- 109 Two or three Orifices for the transmission of some Palatine Branches to the soft Palate.
- 110 Six: two Cranial (Sphenoid and Ethmoid), superior Maxillary, inferior spongy Bone, the Vomer and its fellow of the opposite side.
- 111 Four: Azygos Uvulæ, internal and external Pterygoid, and the Circumflexus Palati.
- 112 From only a single Ossific point.

INFERIOR SPONGY BONES.

- 113 In the Nasal Fossa.
- 114 Into two surfaces (internal and external), and two borders (superior and inferior).
- 115 The internal surface is convex and projects towards the Septum of the Nose.
- 116 The external surface is concave and bounds the inferior Meatus.
- 117 Four articulations: the superior articulates with the ascending process of the superior Maxillary Bone, the Palate Bone, the Lachrymal Bone and the Ethmoid Bone, the inferior or lower border is free,
- 118 None.
- 119 From only one Ossific point.

VOMER.

- 120 The Vomer is the thin perpendicular Plate of Bone in the middle of the Nares, and forms the posterior-inferior part of the Septum.
- 121 The perpendicular Plate of the Ethmoid.
- 122 Into two lateral surfaces and four borders.
- 123 Part of the inner Wall of each Nasal Fossa.
- 124 The Rostrum of the Sphenoid Bone.
- 125 It is received into the fissure or groove formed by the Palatal Processes of the superior Maxillary and Palate Bones.
- 126 This sharp border is free and unattached, and in the recent state forms a Septum which divides the Nares posteriorly.
- 127 This rough border presents a fissure forming two portions or Layers, one of which receives the sharp Edge of the perpendicular Plate of the Ethmoid Bone, and the other the Median Septum or Nasal Cartilage.
- 128 Grooves for the passage of the Vessels and Nerves, and one especially for the Naso-palatine Nerve or Nerve of Cotunnus, which is derived from Meckel's Ganglion.

- 129 None.
- 130 Six : Sphenoid, Ethmoid, two superior Maxillary, and two Palate Bones.
- 131 From only one Ossific point.
- INFERIOR MAXILLARY BONE.
- 132 A considerable portion of the sides and lower part of the Face.
- 133 Into two parts—a horizontal part, which is arched, called the Body, and a perpendicular part on either side called the Ramus.
- 134 The Symphysis.
- 135 Vertical.
- 136 By a triangular process called the Mental process.
- 137 The Mental or Incisive Fossa.
- 138 The origin of the Levator Menti vel Labii Inferioris.
- 139 The terminal Branches of the inferior Dental Nerve and Artery.
- 140 The origin of the Depressor Anguli Oris and Depressor Labii Inferioris, and just below them is the insertion of the Platysma Myoides.
- 141 The Buccinator.
- 142 Concave.
- 143 Four small Tubercles.
- 144 The origin of the Genio-hyo-glossus.
- 145 The origin of the Genio-hyoideus.
- 146 The anterior Belly of the Digastric Muscle.
- 147 The origin of the Mylo-hyoideus, and a little more posteriorly is the origin of part of the superior Constrictor Muscle.
- 148 The Sublingual Gland.
- 149 The Submaxillary Gland.
- 150 Sixteen.
- 151 Two; while the upper have three Fangs.
- 152 At that part where the Ramus and Body meet.
- 153 The Coronoid Process and the Condyle.
- 154 The Coronoid Process.
- 155 The Temporal Muscle.
- 156 The Sigmoid Notch.
- 157 The Masseteric Nerve and Artery, the former derived from the inferior Maxillary Nerve, and the latter from the internal Maxillary Artery.
- 158 The Masseter Muscle.
- 159 The Dental Foramen.
- 160 The inferior Dental Nerve and Artery.

- 161 The Mylo-hyoid Branch of the inferior Dental Nerve.
- 162 The Pterygoideus Internus.
- 163 Oblong and convex, with its long Axis directed horizontally inwards.
- 164 The Glenoid Cavity of the Temporal Bone.
- 165 The Pterygoideus Externus.
- 166 Two: the Glenoid Cavities of the two Temporal Bones.
- 167 Twenty-eight: externally Levator Menti vel Labii Inferioris, Depressor Anguli Oris, Depressor Labii Inferioris, Platysma Myoides, Masseter and Buccinator; internally, Genio-hyo-glossus, Genio-hyoideus, Mylo-hyoideus, Digastricus, external and internal Pterygoid, superior Constrictor of the Pharynx and the Temporal.
- 168 Two; one for each lateral half.

THE TEETH.

- 169 Into two sets; the first called the Temporary or Deciduous Teeth, and the other the Permanent Teeth.
- 170 Twenty; viz. in each jaw—four Incisors, two Canine, and four Molars.
- 171 Thirty-two; viz. in each jaw—four Incisors, two Canine, four Bicuspid, and six Molars.
- 172 Into a Crown, Neck, and Root or Fang.
- 173 The whole exposed surface above the Gum.
- 174 The constricted portion at the base of the Crown.
- 175 The portion which is received into the Alveolus or Socket.
- 176 The Fang and the Alveolus.
- 177 The cutting Edge is sharp, the Crown is somewhat convex anteriorly, and concave posteriorly; the Neck much constricted, and the Fang flattened laterally, which latter is just reverse to the Crown, which is flattened from before backwards.
- 178 A small opening for the transmission of the Artery and Nerve.
- 179 The Crown is larger than an Incisor, convex anteriorly and concave posteriorly, and the Root which is marked by a slight Groove is longer than the rest.
- 180 The Crown is flattened from before backwards, and surmounted by two Tubercles, the Neck is Oval, and the Root which is flattened presents on either side a Deep Groove, which Bifurcates near the Apex.

- 181 The Crown is Cuboid form and surmounted by four Tubercles, the Neck is round and large, and the Root divided into two Fangs in the inferior Maxilla, whilst the superior Maxillary Molar has three Fangs.
- 182 Dentes Sapiientiæ.
- 183 The Root is single and tapering, and grooved indicating a tendency to division; the Root of these Teeth in the superior Maxillary are often Bifid.
- 184 The base of the Crown which is hollowed into a Cavity.
- 185 A soft and Vascular substance called the Pulp, in which the Vessels and Nerves ramify.
- 186 Of three substances; the Ivory, the Enamel, and the Cortical substance.
- 187 All that exposed portion above the Gum.
- 188 A series of minute wavy Tubes which commence in the Pulpy or central Cavity, and radiate towards the surface of the Ivory part.
- 189 A series of six-sided or hexagonal columns, directed perpendicularly to the surface on which they lie, so that one extremity rests on the surface of the Ivory part, whilst the other forms the free surface of the Crown.
- 190 Similar to that of Bones, Cellular and Tubular, the former arranged in Concentric Rings around the latter, similar to the horizontal section of the stem of a tree.
- 191 This substance forms a thin coating around the Root, extending from the termination of the Enamel to the Apex.
- 192 About twenty-five per cent.
- 193 About two per cent. (Berzelius).
- 194 About forty per cent.
- 195 Phosphate and Carbonate of Lime, the former by far the most abundant, $88\frac{1}{2}$ per cent. (Berzelius).
- OS HYOIDES.
- 196 This Bone so called from its resemblance to the Greek letter Upsilon, is placed horizontally between the Base of the Tongue and upper part of the Larynx.
- 197 Into a central part or Body and four Cornua, (two greater and two lesser).
- 198 Quadrilateral.
- 199 The anterior is convex and the posterior concave.
- 200 Muscles.
- 201 Each projects backwards from the body, about one inch and a-half on either side.

- 202 In a Tubercle which is tipped with Cartilage.
 203 On either side from the Angle of union between the body and greater Cornu.
 204 About the size of a barley-corn.
 205 The Stylo-hyoid Ligament.
 206 Ten pairs: Genio-hyo-glossus, Mylo-hyoideus, Genio-hyoideus, Omo-hyoideus, Sterno-hyoideus, Stylo-hyoideus, Digastricus, Hyo-glossus, Thyro-hyoideus, and the middle Constrictor of the Pharynx.
 207 The anterior and posterior Thyro-hyoid Ligaments, and the Stylo-hyoid Ligament, also the Thyro-hyoid Membrane.
 208 Five: one for the body, and one for each of its four Cornua.

SECTION VII.—BONES OF THE TRUNK.

- 1 The Vertebral Column, Thorax, and Pelvis.

VERTEBRAL COLUMN.

- 2 Along the Median line at the posterior part of the Trunk.
 3 Into true and false.
 4 Twenty-four.
 5 Into three: Cervical, Dorsal, and Lumbar.
 6 Seven.
 7 Twelve.
 8 Five.
 9 Into a Body, a Ring or Vertebral Foramen, seven Processes, viz.: two Transverse processes, one Spinous process, and four Articular processes (two superior and two inferior), and four Notches.
 10 Anteriorly; convex before, slightly concave behind, and somewhat flattened on the upper and lower surfaces.
 11 The Ring or Vertebral Foramen.
 12 The Spinal Cord.
 13 For the passage of the Nutrient Vessels.
 14 One on either side the Vertebral Foramen passing off almost horizontally.
 15 At the union of the Laminae posteriorly, from which the Spinous Process arises.
 16 The Laminae are two thick Plates or Lamella of Bone, which pass, one on either side of the Body, posteriorly, where they unite to form the Arch of the Vertebral Foramen.
 17 For the attachment of Muscles.

- 18 The two superior are directed upwards from the *Laminae*, and the two inferior downwards to articulate with the corresponding *Vertebra*, above and below.
- 19 On either side between the body and commencement of the *Arch*; they are so adapted to each other that the union of two *Vertebrae* on either side, forms a rounded opening called the *Inter-vertebral Foramen*, which gives exit to the *Spinal Nerves* and some *Vessels*.
- 20 By their bodies and articular surfaces.
- 21 Nine: so united as to constitute two *Bones*, viz. *Sacrum* and *Coccyx*.
- 22 Five.
- 23 Four.

CERVICAL VERTEBRÆ.

- 24 The *Body* is smaller than a *Dorsal Vertebrae* with the greatest diameter placed transversely, the anterior surface is more flattened.
- 25 In the *Transverse process* on either side is a *Foramen (Vertebral)*, which transmits the *Vertebral Artery*, &c.; on the upper surface on either side is a *Groove* for the passage of the *Spinal Nerves*, this *Groove* bifurcates near the summit, forming two *Tubercles*, (anterior and posterior), for the attachment of *Muscles*.
- 26 The *Spinous processes* are horizontal and short, especially the third, fourth, and fifth, all are bifurcated except the last, and give attachment to *Muscles*.
- 27 The processes are obliquely inclined; the two superior are directed upwards and backwards, and the two inferior forwards and downwards.

ATLAS.

- 28 The *Atlas*.
- 29 It has neither *Body* nor anatomically speaking *Spinous process*, being more like a *Ring*.
- 30 It is much larger.
- 31 To articulate with the *Odontoid process* of the second *Cervical Vertebra* or *Axis*.
- 32 One of the four slips of the *Longus Colli Muscle*, (its insertion).
- 33 Unlike the other *Vertebrae* they are situated behind the *Articular Processes*.
- 34 Oval, and concave, and directed inwards, so as to form two small cavities for the *Condyles* of the *Os Occipitis*.
- 35 Circular and almost horizontal.

- 36 The transverse Ligament which confines the Pivot or Odontoid process of the Axis in its proper sphere.
- 37 Ten pairs: Longus et Splenius Colli, Rectus Anticus Minor, Rectus Posticus Minor, Rectus Lateralis, Obliquus Superior et Inferior, Levator Anguli Scapulæ, the first Inter-transversalis, and the first Inter-spinous.

AXIS.

- 38 So called from having a process on which the Head turns.
- 39 The Odontoid process.
- 40 Two; one corresponding with the articulating surface on the anterior surface or Arch of the Atlas, and the other or posterior for the transverse Ligament.
- 41 Flat, circular, and almost horizontal.
- 42 Oblique, and look downwards and outwards.
- 43 Very short, directed downwards, perforated obliquely, and neither grooved nor bifurcated.
- 44 Larger, broader, and more bifurcated.
- 45 Convex.
- 46 Eleven pairs: Longus et Splenius Colli, Rectus Posticus Major, Semi-spinalis Colli, Inter-spinalis, Multifidus Spinæ, Inter-transversalis, Transversalis Colli, Obliquus Inferior, Scalenus Posticus, and Levator Anguli Scapulæ.
- 47 Vertebra Prominens, so called from its long Spinous Process.
- 48 Similar to the upper Dorsal Vertebra.
- 49 The Ligamentum Nuchæ.
- 50 They are longer and broader, not invariably perforated, nor are they grooved.

DORSAL VERTEBRÆ.

- 51 The body is most convex anteriorly, the vertical depth is greater behind than before, the upper and lower surfaces almost flat, and the two articular surfaces on either side correspond with those on the Heads of the Ribs, the lower of which are the largest, and the Articular Cavity for the Head of the Rib is formed by the Articular Cups of two Vertebrae.
- 52 Thick, strong, and directed obliquely downwards; on either side anteriorly is an articulating surface, for a corresponding Rib.
- 53 Long and considerably inclined downwards, so as to overlap its fellow below.

- 54 They are almost vertical; the upper look directly backwards, and the lower directly forwards.
- 55 Almost round, each decreasing in size from the first to the tenth.
- 56 The body of this Bone has an articular surface for the Head of the first Rib, and a smaller one for only half of that of the second Rib.
- 57 Each have only a single entire articulate surface for the last two Ribs, as their transverse processes which are very small, have no articulating surfaces for the Ribs.
- 58 From the circumstance of the inferior articulating surfaces looking outwards, like those of the Lumbar Vertebrae.

LUMBAR VERTEBRÆ.

- 59 Large, oval, and broad; the greatest diameter being from side to side, unlike a Dorsal Vertebra, the vertical depth is greater before than behind, the edges are somewhat prominent.
- 60 These processes are long and slender, flattened anteriorly and posteriorly, increasing in length from first to third, and then diminish to the fifth.
- 61 This process is short, straight, and broad, on either side; narrow above and below; the last is the shortest and sometimes divided like the one now before me.
- 62 These processes are vertical and strong, the superior concave and facing each other, the inferior somewhat convex and directed forwards and outwards.
- 63 Triangular with rounded angles.
- 64 Generally fifty-two pairs.

BONES OF THE THORAX.

- 65 By the Dorsal Vertebrae posteriorly, the Ribs laterally, and the Sternum anteriorly.
- 66 Transversely on either side the Thorax.
- 67 Twenty-four: twelve on either side.
- 68 Into two classes, true and false.
- 69 The upper seven on either side constitute the true Ribs.
- 70 Because they are each united to the Sternum by Cartilage.
- 71 Into two surfaces (external and internal), two borders and two extremities.
- 72 Convex and smooth, and marked for the attachment of Muscles.
- 73 Flat and concave.
- 74 Rounded and smooth, and gives attachment to the Intercostal Muscles.

- 75 Sharp, and presents on its inner side a deep groove for the lodgment of the Intercostal Vessels and Nerve, and the attachment of the Intercostal Muscles.
- 76 Two articular surfaces to correspond with the articulating surfaces on the bodies of the Vertebrae.
- 77 The Neck, and terminated posteriorly by an articulating Eminence called the Tubercle.
- 78 The transverse process of a corresponding Vertebra .
- 79 Broad and slightly hollowed for the reception of the Costal Cartilage.
- 80 The Angle.
- 81 Between the Tubercle and the most convex part of the Body.
- 82 The Ribs.
- 83 The first.
- 84 It is the most horizontal, the most curved and the shortest, broader and flatter, the two surfaces unlike the rest look upward and downward, nor does it present a groove for the Intercostal Artery.
- 85 Two slightly marked depressions for the passage of the Subclavian Artery and Vein.
- 86 A portion of the Scalenus Anticus Muscle.
- 87 Only a single articular surface which corresponds to that on the transverse process of the first Dorsal Vertebra.
- 88 They are shorter, have neither Neck, Tubercle, nor Groove, and their Heads or posterior extremities have each only a single articulating surface, corresponding with only one Vertebra.
- 89 The latter is rather longer.
- 90 The posterior extremity.
- 91 Ten : five on either side.
- 92 The two last, which by being free at the extremities, are called the Floating Ribs.
- 93 The eighth, ninth, and tenth.
- 94 They are by far the smallest.
- 95 Yes, thirteen ; but very rarely.
- COSTAL CARTILAGES.
- 96 Twelve on either side.
- 97 Seven.
- 98 Three.
- 99 The superior or true Ribs, except the last.
- 100 The last true and first false Ribs.
- 101 Forwards, inwards, and upwards.

- 102 Two; the floating Ribs.
- 103 Two; the first, tenth, eleventh, and twelfth, excepted.
- 104 The Intercostales, Scalenus Anticus et Posticus, Serratus Posticus superior et inferior, Serratus Magnus, the Obliqui, Pectoralis Minor, Latissimus Dorsi, Iliocostalis, Longissimus Dorsi, Levatores Costarum Transversalis Abdominis, Quadratus Lumborum, and Diaphragm.
- 105 The Subclavius, Pectoralis Major, Sterno-Thyroid, Obliquus Internus, Intercostales, Transversalis Abdominis, Diaphragm, Triangularis Sterni et Rectus Abdominis.
- 106 Three; one for the central part or Body, one for the Head, and one for the Tuberosity.
- STERNUM.
- 107 In front of the Chest, forming its anterior and middle part, and about six and a-half inches in length.
- 108 Flat; broad and thick superiorly, and flattened and somewhat pointed inferiorly.
- 109 Into three portions or pieces; superior, middle, and inferior.
- 110 Broad and thick above, and thinner and narrower below, almost resembling a triangle with the angles cut off.
- 111 An articular surface for the reception of the Sternal extremity of the Clavicle.
- 112 Two Notches corresponding to the Articular Cartilages of the first Rib, and one half of the second.
- 113 This Piece is the longest of the three, broader in the middle than at either extremity, and has six articular surfaces for the lower halves of the second, third, fourth, fifth, sixth, and upper half of the seventh Ribs.
- 114 This Piece is elongated and somewhat pointed (in some cases Bifid), and presents on either side a Notch for the Articulation of the lower half of Cartilage of the last true Rib.
- 115 The Ensiform or Xiphoid Cartilage (*Xiphos*, a sword; and *Eidos*, likeness).
- 116 The Aponeuroses of the Abdominal Muscles.
- 117 Sixteen; viz. two Clavicles and the fourteen true Ribs.
- 118 The Pectoralis Major, Sterno-mastoid, Sterno-thyroid, Sterno-hyoid, Triangularis Sterni, the Diaphragm, and by Aponeurosis with the external and internal Oblique, Transversalis, and Rectus Muscles.

- 119 From several, varying from six to twelve.
BONES OF THE PELVIS.
- 120 Os Sacrum, Os Coccygis, and the two Ossa Innominata.
OS SACRUM.
- 121 Triangular, and situated at the posterior part of the Pelvis, immediately below the last Lumbar Vertebra.
- 122 Into two surfaces (anterior and posterior), two sides, a base, and an apex.
- 123 Concave from above downwards, and from side to side.
- 124 Four; indicating originally five Vertebrae, (the Sacrum now before me presents only three lines).
- 125 The large anterior Sacral Foramina.
- 126 The four anterior primary Branches of the Sacral Nerves, the fifth excepted.
- 127 Convex.
- 128 A rough vertical Crest, forming the rudiments of four Spinous Processes, the last or fifth being undeveloped constitutes the Sacral Cornua, corresponding in Articulation with the Cornua of the Coccyx.
- 129 The large posterior Sacral Foramina.
- 130 The four posterior primary Branches of the Sacral Nerves, whilst the fifth issues through the small Notch or Foramen between the Sacrum and Coccyx.
- 131 The Tubercle.
- 132 The Erector Spinæ.
- 133 The Ilium.
- 134 The greater and lesser Sacro-ischiatic Ligaments.
- 135 The inferior articular surface of the last Lumbar Vertebra.
- 136 The rounded or Sacro-vertebral angle which is formed by the union of the upper anterior Border of the base of the Sacrum with the lower anterior Border of the last Lumbar Vertebra.
- 137 Triangular and formed by its Vertebral Arches.
- 138 The inferior articular surface of the last Lumbar Vertebra.
- 139 A Notch which gives passage to the last Lumbar Nerve.
- 140 That of the Coccyx.
- 141 By the Notch on either side corresponding with the Notch in the upper Border of the Coccyx.
- 142 Three.
- 143 Four; the last Lumbar, two Ossa Innominata, (the Iliac portions), and the Coccyx.

144 The *Gluteus Maximus*, *Sacro-lumbalis*, *Latissimus Dorsi*, *Longissimus Dorsi*, *Multifidus Spinæ*, *Coccygeus*, and *Pyriformis*.

145 From about thirty Ossific points.

OS COCCYGIS.

146 Immediately below the Os Sacrum.

147 From its resemblance to a cuckoo's bill or beak, (*Kokkus*, a cuckoo).

148 Four and sometimes five pieces.

149 Concave.

150 Convex.

151 An oval articular surface which unites with the last Sacral Vertebra, also two smaller articular surfaces called Cornua.

152 The corresponding Cornua of the Sacrum.

153 One; the Sacrum.

154 The *Gluteus Maximus*, *Coccygeus*, external *Sphincter* and *Levator Ani*.

155 Each piece has a separate Ossific point.

OSSA INNOMINATA.

156 Two.

157 Into three portions; *Ilium*, *Ischium*, and *Pubis*.

ILIUM.

158 The *Ilium* is the superior expanded portion which forms the prominence of the Hip.

159 Into two surfaces (internal and external), two Borders (anterior and posterior), and Crest.

160 Above by the Crest, below by the *Linea-ilio-pectinea*, and anteriorly and posteriorly by its Borders.

161 Concave and constitutes the *Iliac Fossa*.

162 The origin of the *Iliacus Internus*.

163 The centre of the *Iliac Fossa*.

164 The Brim, which corresponds with the prominent line, (*Linea Ilio-Pectinea*).

165 That portion behind the *Iliac Fossa* which corresponds with the articular surface of the Sacrum.

166 A groove which divides it into two parts, the posterior part gives attachment to the strong *Interosseous Ligaments*, and the anterior part which in the recent subject is coated with *Cartilage*.

167 Yes, for the transmission of the *Nutrient Vessels*.

168 Somewhat irregular, being concave on its posterior half and convex on its anterior half.

- 169 Above by the Crest, below by the projecting Arch, which constitutes the upper circle of the Acetabulum, and anteriorly and posteriorly by its Borders.
- 170 The superior and inferior curved lines.
- 171 From the anterior-superior Spine to the greater Ischiatic Notch.
- 172 From the anterior-inferior Spine to the greater Ischiatic Notch.
- 173 The Gluteus Medius.
- 174 The Gluteus Minimus.
- 175 The posterior-superior Spine and the posterior-inferior Spine.
- 176 Part of the Gluteus Maximus.
- 177 The second Origin of the Rectus Femoris.
- 178 The first origin of the Rectus Femoris.
- 179 Part of the Sartorius.
- 180 The great Sacro-ischiatic Notch.
- 181 Two processes; the anterior-superior and anterior-inferior Spinous processes.
- 182 The Notch which gives attachment to part of the Sartorius, as just stated.
- 183 The anterior termination of the Crista Ilii.
- 184 In the Lip of the Acetabulum.
- 185 Two processes, the posterior-superior and the posterior-inferior Spinous processes.
- 186 Ligaments.
- 187 The upper portion of the greater Sacro-ischiatic Notch.
- 188 The Crista forms the upper, thick, rough Border of the Os Ilii, and extends from the anterior-superior Spinous process, to the posterior-superior Spinous process.
- 189 Three; external, middle, and internal.
- 190 The insertion of the Obliquus Externus Abdominis to the anterior half of its outer edge, and the origin of the Latissimus Dorsi to the posterior half of its outer edge.
- 191 The Obliquus Internus, by its origin from the anterior two-thirds.
- 192 The origins of the Transversalis Abdominis, from its anterior two-thirds; the Quadratus Lumborum, and the Erector Spinæ, from its posterior fifth.
- 193 The base or inferior portion.
- 194 The Ischium.
- 195 The Acetabulum; about two-fifths.

ISCHIUM.

- 196 The Ischium forms the posterior and lowest part of the Os Innominatum.
- 197 Into a Body, Tuberosity, and Ramus which are usually described as presenting two surfaces (external and internal), and three borders—posterior, inferior, and superior.
- 198 The Acetabulum.
- 199 At the lower and posterior part of the Bone, and constitutes the part on which we sit.
- 200 The descending portion of the Ischium.
- 201 The Ilium and Ischium.
- 202 The Obturator Membrane, with one exception at the top, which gives passage to the Obturator Vessels and Nerve.
- 203 The Spine of the Ischium.
- 204 The origin of the Gemellus Superior.
- 205 Above is the origin of the Coccygeus, and below is the origin of a few Fibres of the Levator Ani.
- 206 The lesser Sacro-ischiatic Ligament.
- 207 The Pyriformis Muscle, the Gluteal Vessels and Nerves, the greater and lesser Ischiatic Nerves and Vessels, and exit to the Pudic Vessels and Nerve.
- 208 The greater Sacro-ischiatic Ligament, and transmits the Obturator Internus from, and the Pudic Vessels and Nerve into, the Pelvis.
- 209 The posterior forms the Spine; the inferior, the Tuberosity; and the superior, the lower circumference of the Foramen Ovale.
- 210 Muscles.
- 211 Smooth, and partially encroached upon posteriorly by the Spine.
- 212 The origin of the Gemellus Inferior.
- 213 The origins of the Quadratus Femoris, Semimembranosus, Semitendinosus, and long head of the Biceps Femoris, the two last forming a conjoined Tendon.
- 214 The greater Sacro-ischiatic Ligament.
- 215 The Erector Penis.
- 216 The Transversalis Perinæi.

ACETABULUM.

- 217 This cup-shaped Cavity is formed by the junction of the Ilium, Ischium, and Pubis.
- 218 Two Notches.
- 219 Near the Ilio-pectineal Eminence.

- 220 At the lowest part of the brim.
 221 The Inter-articular Ligament vel Ligamentum Teres, and the Transverse Ligament, which latter completes the margin.
 222 The surface between the Notches is denuded of Cartilage.
 223 A Cord of Fibro-cartilage attached around the brim.
 224 A deep pit, which lodges a mass of fat.

PUBIS.

- 225 At the anterior and inner part of the Pelvis.
 226 Into three portions; the upper thick portion is called the Body, and the other portions the horizontal and descending Rami.
 227 Its fellow of the opposite side by Fibro-cartilage, the union of which is called the Symphysis Pubis.
 228 The origin of the Pectineus.
 229 The Crista.
 230 The inner termination of the Crista.
 231 The outer extremity of the Crista.
 232 The Linea Ilio-pectinea which runs outwards from the Spine of the Bone.
 233 The conjoined Tendon of the Internal Oblique and Transversalis, the Rectus Abdominis (its outer process) and sometimes the Pyramidalis.
 234 Outwards, backwards, and downwards from the Body of the Bone.
 235 With the Ascending Ramus of the Ischium.
 236 Two surfaces and two borders.
 237 Rough, for the attachment of Muscles.
 238 The origins of the Adductor Longus et Brevis, and portions of the Gracilis, Adductor Magnus, and Obturator Externus.
 239 Smooth, and forms part of the lower Wall of the true Pelvic Cavity.
 240 The rough Border forms with its fellow the Arch of the Pubes, and the other, which is thin and sharp, forms part of the Brim or boundary of the Obturator Foramen.
 241 For the attachment of the Crus Penis vel Clitoridis.
 242 The origin of the Compressor vel Constrictor Urethræ.
 243 Three; the Sacrum, Femur, and its fellow of the opposite side.

- 244 Seven; one for each of its divisions, and four secondary, viz. : one for the Crest, one for the anterior-inferior Spine, one for the Tuberosity of the Ischium, and one for the Acetabulum, and sometimes one for the angle of the Pubis.

SECTION VIII.—BONES OF THE UPPER
EXTREMITY.

- 1 Into four classes: the Shoulder, Arm, Forearm, and Hand.

BONES OF THE SHOULDER.

- 2 Into two Bones; the Scapula and Clavicle.

SCAPULA.

- 3 Triangular and placed at the upper and posterior aspect and side of the Thorax, extending from the first to the seventh rib.
- 4 Into two surfaces (anterior and posterior), three borders, (superior, inferior, and posterior), three angles and processes.
- 5 The Sub-scapular Fossa.
- 6 Concave, and presents three or four oblique ridges for the attachment of Tendinous Bands or Fibres.
- 7 The Sub-scapularis.
- 8 The insertion of the Serratus Magnus.
- 9 Convex.
- 10 A prominent ridge of Bone called the Spine.
- 11 The Supra-spinous Fossa.
- 12 The origin of the Supra-spinatus.
- 13 The Infra-spinous Fossa.
- 14 The origin of the Infra-spinatus.
- 15 The origins of the Teres Major and Minor.
- 16 The Infra-spinous Fossa.
- 17 The Superior.
- 18 From the superior angle to that of the Coracoid process.
- 19 The Supra-scapular Notch.
- 20 The Supra-scapular Nerve which is derived from the Brachial Plexus.
- 21 The posterior, commonly called the base.
- 22 From the superior angle to the inferior angle.
- 23 The insertions of the Levator Anguli Scapulæ, Rhomboideus Minor et Major, and Serratus Magnus.
- 24 From the extremity or lower margin of the Glenoid Cavity to the inferior angle below.
- 25 The inferior Border.

- 26 Depressions or Grooves, one of which gives insertion to some of the Muscular Fibres of the Sub-scapularis, another just below the Glenoid Cavity to the middle or long Head of the Triceps Cubiti.
- 27 At the upper third of the posterior Border, and terminates in the Acromion Process.
- 28 The origin of a portion of the Deltoid, and the insertion of a portion of the Trapezius.
- 29 The broad, flat, and arch-like elongated process of the Spine which overhangs the Glenoid Cavity.
- 30 Its anterior Border.
- 31 The anterior, superior, and inferior.
- 32 This angle, the strongest part of the Bone forms the Head.
- 33 An oval and shallow articular surface called the Glenoid Cavity, which is broader below than above.
- 34 By a Rim of Fibro-cartilage.
- 35 By the junction of the posterior Border or base with the superior Border of the Scapula.
- 36 By the junction of the posterior Border or base with the inferior Border of the Scapula.
- 37 The Latissimus Dorsi.
- 38 The Neck is the narrow constricted part at the convergence of the superior and inferior Borders, immediately behind the Glenoid Cavity.
- 39 The round, thick, and curved projection nearly two inches in length, which arises by a broad base from the upper part of the Neck of the Scapula, overhanging the Glenoid Cavity on the inner side.
- 40 The origins of the Coraco-brachialis and short Head of the Biceps.
- 41 The insertion of the Pectoralis Minor.
- 42 Two; with the Humerus by its Glenoid Cavity, and with the Clavicle by its Acromion Process.
- 43 From the superior Border just behind the Supra-scapular Notch.
- 44 Six: one for the Body, two for the Acromion, one for the Coracoid Process, one for the inferior angle, and one for the base.

CLAVICLE.

- 45 This Bone, so called from its resemblance to an ancient key, is situated at the upper and anterior part of the Thorax, extending horizontally from the Scapula to the Sternum.

- 46 Like an *Italic S*, and divided into a Shaft or Body and two extremities, an internal or Sternal, and an external or Scapular extremity.
- 47 The Acromial half is concave and the Sternal half is Convex.
- 48 The Sternal Curve.
- 49 The Pectoralis Major.
- 50 The outer Head of the Sterno-cleido-mastoideus.
- 51 A portion of the Deltoid.
- 52 A portion of the Trapezius.
- 53 The insertion of the Subclavius Muscle.
- 54 The posterior or internal Fasciculus of the Coraco-clavicular Ligament, called the Conoid Ligament.
- 55 The anterior or external Fasciculus of the Coraco-clavicular Ligament called the Trapezoid Ligament.
- 56 The Costo-clavicular or Rhomboid Ligament.
- 57 The Nutrient Artery.
- 58 This thick and strong extremity terminates in a broad and somewhat triangular surface.
- 59 By means of an Inter-articular Fibro-cartilage.
- 60 This extremity which is broad and compressed from above downwards, terminates by an oblong surface, which articulates with the Acromial Process of the Scapula; its inner border.
- 61 The Clavicle.
- 62 Two; the Sternum and Scapula.
- 63 Six.
- 64 From only one Ossific point; its body or shaft.

HUMERUS.

- 65 Irregularly cylindrical and situated at the side of the Thorax, extending from under the Acromion to the Radius and Ulna.
- 66 Into a shaft or body, and two extremities.
- 67 Ridges and depressions for the attachment of Muscles.
- 68 The Deltoid.
- 69 The Coraco-brachialis.
- 70 The Brachialis Anticus which commences by a fleshy Digitation on each side the insertion of the Deltoid.
- 71 On the inner surface of the Bone just below the Ridge, which gives insertion to the Coraco-brachialis Muscle.
- 72 The Musculo-spiral Nerve and superior Profunda Artery, the former derived from the Brachial Plexus, and the latter from the Brachial Artery.

- 73 The second and third or internal and external Heads of origin of the Triceps Extensor Cubiti.
- 74 The rounded Head and immediately around its Base a constriction called the Neck, also two Tuberosities.
- 75 Into the Glenoid Cavity of the Scapula.
- 76 A perpendicular Furrow called the Bicipital Groove.
- 77 The greater Tuberosity.
- 78 The long Tendon or Head of the Biceps Muscle.
- 79 The anterior and posterior Bicipital Ridges.
- 80 The insertion of the Pectoralis Major.
- 81 The insertion of the Teres Major.
- 82 The insertion of the Latissimus Dorsi.
- 83 Supra-spinatus, Infra-spinatus, and the Teres Minor.
- 84 The insertion of the Sub-scapularis.
- 85 Flattened from behind forwards, its greatest diameter being transverse.
- 86 In an articular surface which is divided by a Ridge into two parts, external and internal, the former called the lesser Head, and the latter the Trochlea.
- 87 The shallow articular depression on the Head of the Radius.
- 88 This concave or grooved-like pulley corresponds with the articular surface on the upper extremity of the Ulna.
- 89 The external and internal Condyle.
- 90 The internal Condyle.
- 91 The Flexor Carpi Radialis, Flexor Carpi Ulnaris, Palmaris Longus, and Flexor Sublimis Digitorum, and the Pronator Radii Teres, it also gives attachment to the internal lateral Ligament of the Elbow-joint.
- 92 The Extensor Carpi Radialis Longior et Brevior, Extensor Communis Digitorum, Extensor Carpi Ulnaris, and Extensor Minimi Digiti, the Supinator Radii Longus, and more posteriorly to the Anconeus, also the external lateral Ligament of the Elbow-joint.
- 93 The external and internal Condylloid Ridges.
- 94 The Coronoid Fossa which, during Flexion of the Fore-arm, receives the Coronoid Process of the Ulna.
- 95 The Olecranon Fossa which during extension of the Fore-arm, receives the Olecranon Process of the Ulna.
- 96 The Head is directed inward and backward, the larger Tuberosity forward and outward, the Groove directly forward, the external Condyle forward and outward, and the internal Condyle backward and inward.

- 97 Three; superiorly with the Glenoid Cavity of the Scapula, and inferiorly with the Ulna and Radius.
 98 Seven; the Head, the two Tuberosities, the two Condyles, the Trochlea, and the Shaft or Body.

BONES OF THE FOREARM.

- 99 Two; the Ulna and Radius.
 100 Cylindrical and irregularly triangular, and situated at the inner side of the Forearm.
 101 Into a Body or Shaft and two extremities.
 102 Three surfaces (anterior, posterior, and internal), and three Borders.
 103 The origin of the superior and middle portions of the Flexor Profundus Digitorum vel Perforans.
 104 The Pronator Quadratus.
 105 The Nutrient Artery of the Medulla.
 106 Ridges and uneven surfaces for the attachments of Muscles.
 107 The insertion of the Anconeus.
 108 The origin of the Supinator Radii Brevis.
 109 Extensor Ossis Metacarpi Pollicis, (vel Abductor Longus Pollicis), Extensor Primi Internodii Pollicis, Extensor Secundii Internodii Pollicis, and the Extensor Indicis vel Indicator Muscle.
 110 The Aponeurosis common to the Flexor Carpi Ulnaris, Extensor Carpi Ulnaris, and Flexor Profundus Digitorum.
 111 The Interosseous Membrane.
 112 The greater Sigmoid Notch which corresponds with the Trochlea of the Humerus.
 113 The lesser Sigmoid Notch which corresponds with the Head of the Radius.
 114 The Olecranon Process.
 115 The insertions of the Triceps Extensor Cubiti and Anconeus, and origin of the Flexor Carpi Ulnaris.
 116 The Coronoid Process.
 117 The insertion of the Brachialis Anticus and origins of the Flexor Digitorum Sublimis et Pronator Radii Teres.
 118 The Head.
 119 The Styloid Process.
 120 A Groove for the passage of the Extensor Carpi Ulnaris Tendon.
 121 The oval articular surface at the side of the Radius.
 122 The Humerus and Radius.

- 123 Three; one for the shaft, one for the lower extremity, and one for the Olecranon Process.

RADIUS.

- 124 Cylindrical and irregularly triangular, and placed at the outer side of the Forearm.
- 125 Into a Shaft or Body and two extremities.
- 126 The Ulna.
- 127 Three surfaces (anterior, posterior, and external), bounded by three margins.
- 128 Its superior part is concave and its inferior is flat.
- 129 The origin of the Flexus Longus Pollicis.
- 130 The origin of the Pronator Quadratus.
- 131 About the middle of the anterior surface and directed upwards.
- 132 Chiefly convex.
- 133 The Extensors of the Thumb already named in the description of the Ulna.
- 134 Rounded and convex.
- 135 The insertion of the Pronator Radii Teres.
- 136 The insertion of the Supinator Radii Brevis.
- 137 From the Tuberosity of the Radius to its Styloid Process.
- 138 The Interosseous Ligament or Membrane.
- 139 The Rounded Head; its shallow articular Cavity corresponding to the round articular projection at the inferior extremity of the Humerus.
- 140 The lesser Sigmoid Notch of the Ulna.
- 141 The Neck.
- 142 The Bicipital Tuberosity.
- 143 The Tendon of the Biceps.
- 144 A Bursa.
- 145 The inferior extremity.
- 146 This extremity which is broad and somewhat triangular, presents two articular surfaces.
- 147 Concave and Semi-lunar, and articulates with the rounded Head of the Ulna.
- 148 This surface, which is divided by a small Ridge, articulates with the Scaphoid and Semi-lunar Bones of the Carpus.
- 149 The Styloid Process.
- 150 The Tendon of the Supinator Radii Longus.
- 151 The external lateral Ligament of the Wrist-joint.
- 152 The Tendons of the Extensor Ossis Metacarpi Pollicis, and the Extensor Primi Internodii Pollicis.

- 153 The Tendons of the Extensor Carpi Radialis Longior et Brevior, and the Extensor Secundi Internodii Pollicis, and a little behind these is an oblique Groove for the Tendons of the Extensor Indicis, and Extensor Communis Digitorum.
- 154 By the posterior Annular Ligament.
- 155 Four; the Humerus (two articular surfaces of), the Ulna, and the (two Carpal Bones), Scaphoid and Semi-lunar.
- 156 Three; one for the Body and one for each extremity.
BONES OF THE HAND.
- 157 Twenty-seven.
- 158 Into those of the Carpus, Metacarpus, and Phalanges or Fingers.
CARPUS.
- 159 Dorsal surface convex, Palmar concave, and situated between the Bones of the Forearm and those of the Metacarpus.
- 160 Eight; arranged transversely in two rows.
- 161 Os Scaphoides, Os Semilunare, Os Cuneiforme, et Os Pisiforme.
- 162 Os Trapezium, Os Trapezoides, Os Magnum et Os Unciforme.
OS SCAPHOIDES.
- 163 This Bone which is the first and largest in the first row, is convex on one side and concave on the other.
- 164 Obliquely inwards and forwards.
- 165 The origin of the Abductor Pollicis, and the anterior Annular Ligament.
- 166 A narrow Groove for the attachment of Ligaments.
- 167 Five; Radius, Os Magnum, Os Semilunare, Os Trapezium, and Os Trapezoides.
- 168 The Radius.
- 169 The Os Magnum and Os Semilunare.
- 170 The Trapezium and Os Trapezoides.
- 171 Place the Bone horizontally with the large convex surface, looking towards yourself; and if the broad extremity be directed to the right hand, the Bone belongs to the same Hand; and *vice versa*.
OS SEMILUNARE.
- 172 This is the second Bone in the first row, irregularly triangular, with its superior surface convex, and inferior concave.
- 173 Four, and frequently five articular surfaces, and two extremities, viz. a Dorsal and Palmar extremity.

- 174 The Radius.
 175 The Os Magnum.
 176 The Os Scaphoides.
 177 The Os Cuneiforme, and by a small Facet to the Os Unciforme.
 178 Flat and slightly rough for the attachment of Ligaments.
 179 Convex and rounded.
 180 Five.
 181 Place the Bone with the two Semi-lunar surfaces (which correspond to the Os Magnum and Os Unciforme), downwards and the largest non-articular surface forwards; the larger Semi-lunar articular surface will then be directed to the side to which the Bone belongs.
- OS CUNEIFORME.
- 182 This is the third Bone in the first row and somewhat wedge-shaped.
 183 Three surfaces, a base, and an apex.
 184 The Os Unciforme, to its concave surface.
 185 The Os Semi-lunare, to its base.
 186 The Os Pisiforme, to its circular-articular surface.
 187 Three.
 188 Place the base looking backwards and the circular or Pisiform surface upwards, and the concave or Unciform surface will be directed to the side to which the Bone belongs.
- OS PISIFORME.
- 189 This Bone which is irregularly round is the fourth and last Bone in the first row.
 190 By presenting only one articular surface.
 191 The insertion of the Flexor Carpi Ulnaris, and the origin of the Abductor of the Little Finger, also the Annular Ligament.
 192 Only one, the Os Cuneiforme.
 193 Place the Bone with the articular surface downwards and the extremity or projection which overhangs the articular surface towards yourself; the concave or slightly grooved surface will then be directed to the hand to which it belongs.
- OS TRAPEZIUM.
- 194 This Bone which is irregularly square is the first Bone in the second row, and situated between the first Metacarpal and Scaphoid Bones.
 195 An oblong Eminence or Tubercle and a deep Groove.

- 196 The anterior Annular Ligament.
 197 The Tendon of the Flexor Carpi Radialis.
 198 Four; superiorly with the Scaphoid Bone, inferiorly with the first Metacarpal Bone, and on its Ulnar side with the Trapezoid Bone, and with a small portion of the second Metacarpal Bone.
 199 Two; the origins of the Flexor Osis Metacarpi vel Opponens Pollicis, and the outer Head of the Flexor Brevis Pollicis.
 200 Place the Bone with the Groove looking upwards and its apex forwards; the Concavo-convex or saddle-shaped surface will then be directed to the Hand to which it belongs.

OS TRAPEZOIDES.

- 201 This oblong and somewhat quadrilateral Bone is the second in the second row.
 202 Four; one is Concavo-convex, another concave, and the two others almost flat.
 203 The second Metacarpal Bone.
 204 The Scaphoid Bone.
 205 Os Trapezium.
 206 The Os Magnum.
 207 Four.
 208 Only one, part of the origin of the inner Head of the Flexor Brevis Pollicis.
 209 Place the Bone perpendicularly with the larger extremity looking upwards, and the Concavo-convex or inferior surface looking directly forwards; the angular concave or radial articular surface will then be directed to the Hand to which it belongs.

OS MAGNUM.

- 210 The Os Magnnm, and divided into a Body, Head, and Extremity.
 211 Round in the greater portion of its extent, and forms the third Bone in the second row.
 212 Four surfaces; a Dorsal, Palmar, and two articular surfaces.
 213 Three; viz. the third Metacarpal Bone, and on either side with a small portion of the second and fourth Metacarpal Bones.
 214 Two; viz. the Scaphoid and Semi-lunar Bones.
 215 The Unciform Bone.
 216 The Trapezoid Bone.
 217 Seven.

- 218 Only one; part of the origin of the inner Head of the Flexor Brevis Pollicis.
- 219 Place the Bone perpendicularly with the broadest non-articular or Dorsal surface looking backwards (*i.e.* towards yourself,) and the inferior or articular extremity looking upwards; the concave articular surface will then be directed to the Hand to which it belongs.

OS UNCIFORME.

- 220 This Bone which possesses a curved or hook-like process on its Palmar surface is of a triangular form, and is the last Bone of the second row.
- 221 Five; viz. three articular and two free.
- 222 Two; the fourth and fifth Metacarpal Bones.
- 223 The Os Semi-Lunare.
- 224 The Os Magnum.
- 225 The Os Cuneiforme.
- 226 Five.
- 227 Two; the origins of the Flexor Brevis Minimi Digiti, and the Adductor (vel Opponens) Minimi Digiti.
- 228 Place the Bone so that the curved process looks downwards, and the base or Metacarpal surfaces directly forwards; the convexity of the process will then be directed to the Hand to which it belongs.
- 229 Seven; Abductor Pollicis, Opponens Pollicis, Flexor Brevis Pollicis, Flexor Brevis Minimi Digiti, Adductor vel Opponens Minimi Digiti, and Abductor Minimi Digiti, by their origins; and the Flexor Carpi Ulnaris, by its insertion.
- 230 Each Bone presents only one Ossific point.

METACARPUS.

- 231 Five.
- 232 Between the Carpus and Phalanges.
- 233 Into a Body and two extremities.
- 234 The Base.
- 235 The Head.
- 236 Concave on the Palmar, and convex on the Dorsal surface.
- 237 Upwards.
- 238 Downwards.
- 239 The Interosseous Muscles.
- 240 Rounded or convex and flattened laterally.
- 241 The first row of Phalanges.
- 242 The lateral Ligament.

- 243 The second row of the Carpus, viz.: Trapezium, Trapezoides, Os Magnum, and Os Unciforme.
- 244 The Trapezium.
- 245 The Trapezium, Trapezoides, Os Magnum, and the third Metacarpal Bone.
- 246 The Os Magnum and its fellow on either side, viz.: the second and fourth.
- 247 The Os Magnum, Os Unciforme and its fellow on either side, viz.: the third and last.
- 248 The Os Unciforme and the fourth Metacarpal Bone.
- 249 The second.
- 250 The first.
- 251 By its peculiar Concavo-convex or saddle-shaped articular surface at its upper extremity, corresponding to the Concavo-convex or saddle-shaped surface on the Trapezium, also by its shaft or body being shorter and broader than the others.
- 252 Place the Bone with its base looking towards yourself and the Dorsal aspect upwards; the articular surface on the side of the base will be directed from the side to which the Bone belongs.
- 253 Three; the insertions of the Flexor Ossis Metacarpi vel Opponens Pollicis, and Extensor Ossis Metacarpi (vel Abductor Longus) Pollicis, and the origin of one Head of the first Dorsal Interosseous Muscle.
- 254 By its base or upper extremity presenting an uneven surface, which corresponds to the articular surfaces of the Trapezium, Trapezoides, and Os Magnum, and by its presenting only one lateral Facet which corresponds with that on the third Metacarpal Bone.
- 255 Place the Bone with the Base looking towards yourself and the Dorsal aspect upwards; the lateral articular surface will then be on the side to which it belongs.
- 256 The insertions of the Flexor Carpi Radialis, and Extensor Carpi Radialis Longior, and the origins of Dorsal and Palmar Interossei.
- 257 By the angular process on the radial side of its base or upper extremity, which gives insertion to the Extensor Carpi Radialis Brevior Muscle.
- 258 Place the Bone with the base looking towards yourself and the Dorsal aspect upwards; the corner of the base which has no projection will then be on the side to which it belongs.

- 259 The insertions of the Extensor Carpi Radialis Brevior, and the origins of the Adductor Pollicis (on its Palmar aspect), and the Interossei.
- 260 To its angular process.
- 261 By its base or upper extremity, being small and square, and by the absence of the angular projecting process.
- 262 Place the Bone with the base looking towards yourself and the Dorsal aspect upwards; the base will then be slightly inclined towards the side to which it belongs.
- 263 Palmar and Dorsal Interossei.
- 264 By its having only one lateral articular surface corresponding with that on the Ulnar side of the Metacarpal Bone of the ring Finger.
- 265 Place the Bone with the base looking towards yourself and the Dorsal aspect upwards; that side of the base which has no articular surface will be directed to the Hand to which it belongs.
- 266 To its base, the insertion of the Extensor Carpi Ulnaris, and by origin to its Ulnar Border, the Adductor vel Opponens Minimi Digiti, and the Palmar and Dorsal Interossei.
- 267 Nine; five Phalangeal and four Carpal.
- 268 Three; one for the shaft and one for each extremity.

PHALANGES.

- 269 Fourteen to each hand, viz.: three to each Finger and two to the Thumb.
- 270 Into a shaft and two extremities, viz.: a Head and Base.
- 271 Convex posteriorly and flat anteriorly.
- 272 Ridges or margins for the attachments of the Fibrous Sheaths of the Tendons.
- 273 Oval and concave for the reception of the convex Head of the corresponding Metacarpal Bone.
- 274 The insertions of the Interossei.
- 275 By two small Condyles (separated by a slight Ridge), corresponding to the bases of the contiguous Bones of the Fingers.
- 276 By their greater length and by their upper or Metacarpal extremities not strictly forming hinge-joints.
- 277 By their bases or upper extremities having two articulate surfaces, separated by a small Ridge, corresponding with the Heads or lower extremities of the contiguous surfaces of the first Phalanges.

- 278 These Bones are the shortest, their Dorsal surfaces are smooth for the attachment of the Nails, and their Palmar surfaces rough.
- 279 The Metacarpal Bones and the second row of Phalanges.
- 280 The first and third rows.
- 281 Those of the second row.
- 282 The first Phalanges at their bases or upper Metacarpal extremities.
- 283 To the base or Metacarpal extremity of the first Phalanx are the insertions of the Adductor Pollicis Flexor Brevis Pollicis, Abductor Pollicis and Extensor Primi Internodii, to the second, third, and fourth, the Palmar and Dorsal Interossei, and to the base of the last Phalanx of this row the insertions of Abductor Minimi Digiti, Flexor Brevis Minimi Digiti, and one Palmar Interosseous.
- 284 To the base or Metacarpal extremity of the last Phalanx of the Thumb are the insertions of the Flexor Longus Pollicis, and Extensor Secundi Internodii Pollicis, to the other Phalanges, the insertions of the Flexor Sublimis Digitorum vel Perforatus, and Extensor Communis Digitorum; the Extensor Minimi Digiti joins the common Tendon in the two last Phalanges of the little Finger.
- 285 The insertions of the Flexor Profundus Digitorum vel Perforans, and the Extensor Communis Digitorum.
- 286 Into the common Tendon of the Index Finger.
- 287 Two: one for the body and one for the base.

OSSA SESAMOIDEA.

- 288 Small Osseous masses developed in certain Tendinous extremities, *e.g.* in the upper extremity two exist in each inserted Tendon of the Flexor Brevis Pollicis at the articulation of the first Metacarpal Bone, with the first Phalanx in the lower extremity is the Patella developed in the common Tendon of the Quadriceps Extensor Muscle, one exists in the Tendon of the Peroneus Longus Muscle, as it passes through the Groove or depression in the Os Cuboides, another exists in the Tendon of the Tibialis Posticus Muscle beneath the articulation of the Astragalus, two exist in the first Metatarso-phalangeal Articulation on its Palmar surface, developed in the Tendinous insertions of the Flexor Brevis Pollicis Pedis Muscle.
- 289 Flexor Longus Pollicis Pedis.

SECTION IX.—BONES OF THE LOWER
EXTREMITY.

- 1 Into the Thigh, Leg, and Foot.
- 2 The Os Femoris.
FEMUR.
- 3 Into a Body and two extremities (superior and inferior).
- 4 Nearly cylindrical, being somewhat arched with its convexity directed forwards.
- 5 Linea Aspera, which bifurcates above and below.
- 6 The upper Lips or Borders terminate: the inner one at the Root of the lesser Trochanter, and the outer one at the Root of the greater Trochanter.
- 7 At the Tuberosities of the Condyles, forming the internal and external Condylloid Ridges.
- 8 The Popliteal surface of the Femur corresponding with the Popliteal Vessels.
- 9 The Head, Neck, and two Eminences called Trochanters.
- 10 Upwards and inwards, and presents a little behind and below its centre an oval depression for the attachment of the round Ligament.
- 11 Upwards and inwards from the shaft, and compressed from before backwards.
- 12 Three; anterior, superior, and inferior.
- 13 The inferior surface.
- 14 Upwards, and somewhat concave.
- 15 Smooth and broad.
- 16 The larger outstanding process external to the Neck.
- 17 The insertion of the Gluteus Minimus and to its outer surface Gluteus Medius.
- 18 Part of the origin of the Vastus Externus.
- 19 The Tendons of the Obturator Internus, Gemellus Superior et Inferior, and the Pyliformis.
- 20 The Tendon of the Obturator Externus.
- 21 The smaller outstanding process at the inner and back part of the shaft, immediately below the base of the Neck.
- 22 The Tendons of insertion of the Psoas Magnus and Iliacus.
- 23 The Inter-trochanteric Ridges.
- 24 The inferior boundary of the Neck of the Femur.
- 25 The two Condyles.
- 26 The inner Condyle.
- 27 A deep Notch, the Inter-Condylloid Notch, in which are inserted the Crucial Ligaments.

- 28 The external lateral Ligament of the Knee-joint.
 29 The origins of the outer Head of the Gastrocnemius and Plantaris.
 30 The internal lateral Ligaments, also to the insertion of a few Fibres of the Adductor Magnus.
 31 The origin of the inner Head of the Gastrocnemius.
 32 Three Muscles, viz. : the Vastus Externus et Internus, and the Crureus.
 33 The origins of the Crureus and Sub-crureus.
 34 The origin of the Vastus Internus.
 35 The origin of the Vastus Externus.
 36 The Crureus.
 37 The insertions of the Adductor Longus, Magnus et Brevis, Gluteus Maximus, and Pectineus, and the origin of the short Head of the Biceps.
 38 The insertion of the Quadratus Femoris.
 39 On the Linea Aspera immediately below the insertion of the Gluteus Maximus.
 40 The Popliteus.
 41 A Bursa.
 42 Twenty-three.
 43 Three; the Os Innominatum, Tibia, and Patella.
 44 Five; one for the body, one for each extremity, and two secondary deposits for the Trochanters.

PATELLA.

- 45 A Sesamoid Bone developed in the Extensor Tendon of the Knee; the Quadriceps Extensor.
 46 Immediately above the Tibia, and somewhat triangular or heart-shaped, with the broad portion directed upwards and the apex downwards.
 47 Into a base, apex, and two surfaces (anterior and posterior).
 48 Convex.
 49 Smooth, and divided by a vertical Ridge into two articular surfaces, external and internal, corresponding to the articular Condyloid surfaces of the Femur.
 50 The external; this circumstance alone will indicate to which Leg the Bone belongs.
 51 The insertion of the Quadriceps Extensor Tendon.
 52 The Ligamentum Patellæ.
 53 One; the two Condyles of the Femur.
 54 From only one Ossific point.

BONES OF THE LEG.

- 55 Two; the Tibia and Fibula.

- 56 The Tibia.
- TIBIA.
- 57 This Bone is placed on the inner side of the Leg.
- 58 Into a Shaft and two extremities.
- 59 Triangular.
- 60 Three; external, internal, and posterior.
- 61 This surface is Superficial and Sub-cutaneous.
- 62 This surface is somewhat hollowed and marked by a sharp Ridge, which gives attachment to the Interosseous Ligament.
- 63 The origin of the Tibialis Anticus.
- 64 This surface is grooved for the attachment of Muscles, and presents along its upper third a rough line running obliquely from the outer towards the inner side, called the Popliteal line, which gives attachment to the Popliteal Fascia.
- 65 The insertion of the Popliteus.
- 66 The origins of the Soleus Flexor Longus Digitorum Pedis and part of the Tibialis Posticus.
- 67 The Medullary Canal which is the largest in the Cylindrical Bones and runs obliquely downwards.
- 68 Two broad horizontal and slightly excavated articular surfaces forming two Tuberosities, (external and internal).
- 69 Round.
- 70 Oval.
- 71 A projection called the Spinous Process.
- 72 The anterior and posterior Crucial Ligaments and the Inter-articular or Semi-lunar Cartilage.
- 73 The articular surface on the Head of the Fibula.
- 74 The Tibialis Anticus & Extensor Longus Digitorum Pedis.
- 75 The Semimembranosus, Sartorius, Gracilis, and Semitendinosus.
- 76 The Tubercle which gives attachment to the Ligamentum Patellæ.
- 77 Somewhat quadrilateral.
- 78 The Malleolus Internus.
- 79 The Tendons of insertion of the Tibialis Posticus and Flexor Longus Digitorum Pedis.
- 80 The Astragalus.
- 81 The Interosseous Membrane.
- 82 The articular surface of the Fibula.
- 83 With one of the Tarsal Bones, the Astragalus.
- 84 A Synovial Bursa.
- 85 Three; the Femur, Fibula, and Astragalus.

- 86 Ten.
- 87 Three; one for the Body, and two for the extremities.
- 88 The Fibula.
- FIBULA.
- 89 This Bone is placed on the outer side of the Leg.
- 90 Into a Body or Shaft and two extremities.
- 91 The lower three-fourths triangular, and the upper somewhat rounded.
- 92 Three; internal, external, and posterior.
- 93 A longitudinal Ridge called the Interosseous Ridge.
- 94 The Interosseous Ligament which divides the anterior and posterior Muscles of the Leg.
- 95 Part of the origin of the Tibialis Posticus.
- 96 Part of the origins of the Extensor Longus Digitorum, Extensor Proprius Pollicis and Peroneus Tertius.
- 97 The external surface.
- 98 Origins of the Peroneus Longus above, et Brevis below.
- 99 The Medullary Canal which is directed obliquely downwards.
- 100 To its upper third or half is the Soleus, and to its lower half or two-thirds the Flexor Longus Pollicis.
- 101 Three; internal, external, and posterior.
- 102 This Border commencing above in the Interosseous Ridge, divides inferiorly into two lines which enclose the triangular Sub-cutaneous surface of the outer Malleolus.
- 103 At the base of the Styloid Process of the Fibula.
- 104 In the Interosseous Ridge.
- 105 The Head.
- 106 Oval, and articulates with the corresponding part on the outer Tuberosity of the Tibia.
- 107 Styloid Process, called by Owen "Fibella."
- 108 The Tendon of the Biceps Femoris vel Flexor Cruris.
- 109 The lower extremity flattened from without inwards is prolonged below the articular surface, and forms the outer Malleolus.
- 110 Somewhat convex, and articulates with the side of the Astragalus.
- 111 The Interosseous Ligament.
- 112 The Tendons of the Peroneus Longus et Brevis.
- 113 The external lateral Ligament of the Ankle-joint.
- 114 Two; at each extremity with the Tibia, and the outer Border of the Astragalus.
- 115 Nine.
- 116 Three; one for the Shaft and two for the extremities.

BONES OF THE FOOT.

117 Twenty-six.

118 Into three classes, viz. : Tarsus, Metatarsus, and Toes.

TARSUS.

119 The Tarsus forms the posterior part of the Foot.

120 Seven; Astragalus, Os Calcis, Os Scaphoides, Os Cuboides, and the three Ossa Cuneiformia (Internum, Medium, et Externum).

121 The Astragalus.

ASTRAGALUS.

122 This extremely irregular Bone presents six aspects, viz. : a superior and an inferior surface, an external and an internal Border, and an anterior and a posterior extremity.

123 A broad articular surface, convex from before backwards, which articulates with the corresponding surface of the Tibia.

124 This surface presents two articular Facettes, which are divided by a deep transverse Groove for the lodgment of the Interosseous Ligament.

125 The anterior surface is flat and the posterior concave, both are directed obliquely downwards and forwards, and articulate with the Os Calcis.

126 A triangular articular surface (corresponding with the outer Malleolus), somewhat concave anteriorly, with its apex downwards.

127 A small articular surface of a Pyriform shape, corresponding with the inner Malleolus.

128 A rounded Head which corresponds to the Socket formed anteriorly by the Os Scaphoides, inferiorly by the Os Calcis, and completed by the inferior elastic Ligament, (the Calcaneo-scaphoid).

129 A Groove for the passage of the Tendon of the Flexor Longus Pollicis Pedis.

130 Place the Bone with the broad articular surface on its superior aspect, looking upwards, and the large convex Head on its anterior extremity directed forwards; the lateral triangular articular surface on the external Border will be directed to the Foot to which it belongs.

131 Four; the Tibia and Fibula above, the Os Calcis below, and the Os Naviculare anteriorly.

132 None.

133 The Os Calcis vel Calcaneum.

OS CALCIS.

- 134 At the posterior and inferior part of the Tarsus.
- 135 Into four surfaces (superior, inferior, internal, and external), and two extremities (anterior and posterior).
- 136 Two articular surfaces; the posterior, which is the largest, is convex, and the anterior somewhat concave.
- 137 Those of the Astragalus.
- 138 The Interosseous Ligament.
- 139 By its union with the corresponding one in the Astragalus, (Canalis Tarsi).
- 140 Rough and convex, and presents posteriorly two Tubercles, (an external and internal one, the latter the largest).
- 141 The origin of the superficial Plantar Muscles and the thick Plantar Fascia.
- 142 Deeply concave for the passage of the Plantar or Flexor Tendons, Vessels and Nerves.
- 143 Sustentaculum Tali, which assists to support the anterior articular surface or Head of the Astragalus.
- 144 The Calcaneo-scaploid or inferior elastic Ligament.
- 145 The Tendons of the Flexor Longus Pollicis, and Flexor Longus Digitorum Pedis.
- 146 Broad, somewhat convex and sub-cutaneous, and marked near its middle by two small Grooves divided by a Tubercle.
- 147 The Tendons of the Peroneus Longus et Brevis.
- 148 A smooth articular surface which corresponds with the Os Cuboides.
- 149 The origin of the Extensor Brevis Digitorum.
- 150 This extremity, which forms the Heel, is convex and presents two surfaces, an upper and a lower; in the upper and smooth part is situated, between the Tendo Achillis and the Bone, a Bursa; and the lower or rough part indicates the insertion of the Tendo Achillis.
- 151 Two; the Astragalus and Os Cuboides.
- 152 Eight; the conjoined Tendon of the Soleus and Gastrocnemius, conjointly with the Plantaris Tendon, Abductor Pollicis, Abductor Minimi Digiti, Flexor Brevis Digitorum, Flexor Accessorius, and the Extensor Brevis Digitorum Pedis.

OS SCAPHOIDES.

- 153 At the inner Border of the Tarsus between the Astragalus and Ossa Cuneiformia.

- 154 Into two surfaces (anterior and posterior), two Borders (superior and inferior), and two extremities.
- 155 Convex, and presents three articular Facettes, corresponding with those of the three Cuneiform Bones.
- 156 Concave, its articular surface corresponding with the rounded Head of the Astragalus.
- 157 Convex.
- 158 Slightly concave.
- 159 A small articular surface corresponding with one on the Os Cuboides.
- 160 A Tubercle which projects on the inner side of the Tarsus.
- 161 The inserted Tendon of the Tibialis Posticus.
- 162 A Sesamoid Bone.
- 163 Five; Astragalus, the three Ossa Cuneiformia, and the Os Cuboides.
- 164 Only one; the Tendon of the Tibialis Posticus.
- 165 The anterior Tibial Artery.
- 166 Place the Bone with the three articular surfaces looking forwards, and the superior convex Border upwards; the broad extremity will then be directed to the Foot to which it belongs.
- OS CUBOIDES.
- 167 At the external side of the Tarsus, between the Os Calcis and the two last Metatarsal Bones.
- 168 Into three articular and three non-articular surfaces.
- 169 Into posterior, anterior, and internal.
- 170 The posterior and of a Concavo-convex form.
- 171 The anterior articular surface of the Os Calcis.
- 172 Two smooth articular Facettes corresponding with those on the bases of the fourth and fifth Metatarsal Bones.
- 173 Two articular Facettes, corresponding with the outer Cuneiform Bone and the Os Scaphoides.
- 174 Into superior, inferior, and external.
- 175 Somewhat convex, and aids in the formation of the Dorsum of the Tarsus.
- 176 A deep Groove for the passage of the Peroneus Longus Tendon.
- 177 The Calcaneo-Cuboid Ligament.
- 178 The external, which is marked by a deep Notch, indicating the commencement of the Peroneal Groove.
- 179 Five; Os Calcis, Os Cuneiforme Externum, Os Scaphoides, and the fourth and fifth Metatarsal Bones.
- 180 Two; the origins of the Flexor Brevis Pollicis and the Adductor Pollicis Pedis.

- 181 Place the Bone with the Peroneal Groove looking downwards, and the posterior or largest articular surface looking backwards; the smaller or external non-articular surface, which is marked by the deep Notch, will be directed to the Foot to which it belongs.
- OSSA CUNEIFORMIA.
- 182 Three; internal, middle, and external.
- 183 The first or internal one.
- 184 Into four surfaces; anterior, inferior, external, and internal.
- 185 This surface, which is somewhat convex, articulates with the base of the first Metatarsal Bone.
- 186 The insertion of the Tibialis Anticus, and to one of the inserted processes of the Tibialis Posticus.
- 187 One of the three articular Facettes on the Scaphoid Bone.
- 188 This surface, which is somewhat concave, articulates with the middle Cuneiform Bone, and the second Metatarsal Bone.
- 189 This is convex and presents a smooth surface, over which the Tendon of the Tibialis Anticus passes to its insertion on the under surface.
- 190 Four; Os Scaphoides, Os Cuneiforme Medium, and the two first Metatarsal Bones.
- 191 Two; the Tibialis Anticus et Posticus.
- 192 Place the Bone with the base downwards, and the anterior articular surface forwards; the concave surface will then be directed to the Foot to which the Bone belongs.
- 193 The Os Cuneiforme Medium.
- 194 Wedge-shaped, with its base upwards, and situated between the first and third Cuneiform Bones.
- 195 Into four articular surfaces (anterior, posterior, and lateral), and two extremities (base and apex).
- 196 The base of the second Metatarsal Bone.
- 197 The Scaphoid Bone.
- 198 The Os Cuneiforme Externum.
- 199 The Os Cuneiforme Internum.
- 200 Four; the second Bone of the Metatarsus, Scaphoid, and its fellow on either side.
- 201 One; part of the Tendon of the Flexor Brevis Pollicis Pedis.
- 202 Place the Bone with the narrowest side of the base directed forwards and the apex downwards; the small vertical articular surface will be directed to the Foot to which it belongs.

- 203 Somewhat wedge-shaped with its base upwards and apex downwards, and situated to the outer side of the middle Cuneiform Bone.
- 204 Into six articular surfaces (anterior, posterior, and four lateral), and two extremities (base and apex).
- 205 The base of the third Metatarsal Bone.
- 206 The Scaphoid Bone.
- 207 The Cuboid Bone, and by a small Facette with the fourth Metatarsal Bone.
- 208 The middle Cuneiform Bone, and by a small Facette with the second Metatarsal Bone.
- 209 Six; the second, third, and fourth Metatarsal Bones, Scaphoid, Cuboid, and the middle Cuneiform Bone.
- 210 One, part of the Tendon of the Flexor Brevis Pollicis Pedis to its apex or inferior extremity.
- 211 Place the Bone with the square extremity directed upwards, and the sharp edge or Ridge backwards; the bevelled surface will then be directed to the Foot to which it belongs.
- 212 Each Bone has only one Ossific point, except the Os Calcis which possesses two.
- 213 Twelve.

METATARSUS.

- 214 Between the Tarsus and Toes.
- 215 Five.
- 216 The first.
- 217 The second.
- 218 Into a shaft and two extremities (posterior or base, and anterior or Head).
- 219 Triangular.
- 220 Almost square.
- 221 With the second row of Tarsal Bones, and laterally with each other.
- 222 With the first row of Phalanges.

FIRST METATARSAL BONE.

- 223 With the first or internal Cuneiform Bone.
- 224 A small process for the insertion of the Peroneus Longus Tendon.
- 225 Two small Facettes corresponding to the two Sesamoid Bones.
- 226 Three; the internal Cuneiform Bone, the first Phalanx, and the second Metatarsal Bone.
- 227 Two; the Peroneus Longus and first Dorsal Interosseous.

- 228 Place the Bone in its natural position with its base directed towards yourself; the concave side of the articular surface at its base will be directed towards the Foot to which it belongs.

SECOND METATARSAL BONE.

- 229 Five; corresponding to the three Cuneiform Bones, and its fellow on either side.
- 230 Six; the three Cuneiform Bones, its fellow of either side, and the second Phalanx of the first row.
- 231 The Transversus Pedis and two Dorsal Interossei.
- 232 Place the Bone in its natural position with the base or posterior extremity directed towards yourself; the lateral Facettes will then be directed to the Foot to which it belongs.

THIRD METATARSAL BONE.

- 233 Four; one for the outer Cuneiform Bone, one on the outer side of the base for the fourth Metatarsal Bone, and two on the inner side of the base for the second Metatarsal Bone.
- 234 Four; the external Cuneiform Bone, its fellow of either side, and the third Phalanx of the first row.
- 235 The Adductor Pollicis Pedis, Transversus Pedis, second and third Dorsal, and the first Plantar Interosseous.
- 236 Place the Bone in its natural situation with its base or posterior extremity towards yourself; the single lateral Facette will be on the side to which it belongs.

FOURTH METATARSAL BONE.

- 237 Four; corresponding to the Cuboid Bone, its fellow on either side, and a small portion of the outer Cuneiform Bone.
- 238 Five; the Cuboid, its fellow on either side, to a small portion of the third Cuneiform, and the fourth Phalanx of the first row.
- 239 Five; the Adductor Pollicis Pedis, Transversus Pedis, third and fourth Dorsal, and second Plantar Interosseous.
- 240 Place the Bone in its natural position, with the base directed towards yourself; and it will be observed that the base will be slightly inclined to the Foot to which it belongs.

FIFTH METATARSAL BONE.

- 241 Two; corresponding to the Cuboid and fourth Metatarsal Bones.
- 242 A long projection.

- 243 The insertions of the *Peroneus Tertius et Brevis*.
 244 Three; the Cuboid, the fourth Metatarsal Bone, and the last Phalanx of the first row.
 245 Six; *Peroneus Tertius et Brevis*, *Flexor Brevis Minimi Digiti*, *Transversus Pedis*, fourth Dorsal and third Plantar Interosseous.
 246 Place the Bone in its natural position with the base directed towards yourself; its process will then be on the side to which it belongs.

PHALANGES OF THE TOES.

- 247 Fourteen; three to each of the four outer Toes, and two to the great Toe.
 248 Into a shaft and two extremities.
 249 Convex on the Dorsal and concave on the Palmar surface, and compressed laterally.
 250 A concave articular surface corresponding with the Head of the Metatarsal Bone.
 251 Two rounded Heads (divided by a pulley-like surface), corresponding to the second Phalanx.
 252 Ten; viz., the Metatarsal Bones and the second row of Phalanges.
 253 Two small concave articular surfaces corresponding with the Head of the first Phalanx.
 254 Two small Condyles corresponding with the base of the last Phalanx.
 255 The third or last row of Phalanges.
 256 With the exception of that of the great Toe they articulate with the first and last rows of Phalanges.
 257 The second row of Phalanges.
 258 Rough and Scabrous.
 259 To the great Toe the *Extensor Brevis Digitorum*, *Adductor Pollicis*, *Flexor Brevis Pollicis*, *Abductor Pollicis*, and *Transversus Pedis*; to the second, third, and fourth Toes, the first, second, and third Dorsal, the *Lumbricales Pedis*, and to the third and fourth, the first and second Plantar Interossei, to the fifth Toe the fourth or last Dorsal, *Lumbricalis Pedis*, the third or last Plantar Interosseous, also the *Abductor Minimi Digiti*, & the *Flexor Brevis Minimi Digiti*.
 260 To the great Toe or Ungual Phalanx, the *Extensor Proprius Pollicis*, and *Flexor Longus Pollicis Pedis*, to the other Toes in this row the Tendons of the *Flexor Brevis Digitorum*, *Extensor Longus Digitorum*, and *Extensor Brevis Digitorum*.

- 261 The common Tendons of the Extensor Longus et Brevis. Digitorum, and Flexor Longus Digitorum.
 262 Two; one for the shaft and one for the base.
 263 The Sesamoid Bones.

SECTION X.—CHONDROLOGY.

CARTILAGES.

- 1 Bone, Cartilage, Ligament, and Synovial Membrane.
- 2 Cartilages are the white, compact, elastic, and cellular substances, forming the thin layers on the articulating extremities of Bones, varying from half a line to two lines in thickness.
- 3 Four; Diarthroidal, Synarthroidal, Interarticular, and those which supply the place of Bone.
- 4 Cartilages which cover the extremities of Bones, having moveable Joints; *see Articulations of Bones.*
- 5 Cartilages placed between Bones which have no perceptible motion on each other; *see Articulations of Bones.*
- 6 Inferior Maxillary Bone, Knee, Wrist-joint, &c.
- 7 Ligamenta Intervertebralia vel Intervertebral Substance.
- 8 Cartilages of the Larynx, Trachea, Nose, Ears, Costal-Cartilages, &c.

SECTION XI.—SYNDESMOLOGY.

LIGAMENTS.

- 1 Ligaments are the strong flexible Strata of Fibres connecting those Bones together which form moveable Joints.
- 2 Into two kinds; Capsular and Connecting.
- 3 Those of the Hip-joint, Shoulder-joint, &c.
- 4 From their position into anterior, posterior, internal and external lateral, round, crucial, &c.
- 5 Ligamenta Subflava.
- 6 The thin Membranous Layers which invest the articular Cartilages of the Bones, and thence reflected on the surfaces of the Ligaments which surround the Joint, they form one of the three orders of Serous Membranes, and like them are, with one exception in the Human Body, closed Sacs, viz. : the opening of the Fallopiian Tubes into the Abdominal Cavity.
- 7 An Alkaline Albuminous Fluid, called Synovia, which coagulates at 212 degrees Fahrenheit.

ARTICULATIONS OF THE JOINTS.

- 8 Into three classes; those of the Head and Trunk, Upper Extremity and Lower Extremity.

LIGAMENTS OF THE TRUNK.

- 9 Into seven groups; those of the Vertebral Column, of the Cranium, of the lower Jaw, of the Ribs with the Vertebrae, of the Ribs with the Sternum and with each other, of the Vertebral Column with the Pelvis, and of the Pelvis.

ARTICULATIONS OF THE SPINE.

- 10 The anterior and posterior common Ligament and the Inter-vertebral substance.
- 11 From the Atlas to the Sacrum.
- 12 This Ligament, situated within the Spinal Canal and attached to the posterior surfaces of the bodies of the Vertebrae, extends from the Atlas to the Sacrum.
- 13 These circular Discs are situated between the contiguous surfaces of the bodies of the Vertebrae, connected with the anterior and posterior common Ligaments, and laterally with the Stellate or anterior Costo-vertebral Ligaments of the Heads of the Ribs.
- 14 Ligamenta Subflava, which extend from the Axis to the Sacrum.
- 15 Capsular Ligaments which enclose each a Synovial Membrane.
- 16 Supra-spinous and Inter-spinous Ligaments.
- 17 These strong Fibrous Bands are attached to the summits of the Spinous Processes, throughout the Dorsal and Lumbar Vertebrae.
- 18 The Ligamentum Nuchae.
- 19 These thin and Membranous-like Ligaments extend from the Root to the summit of each Spinous Process, connecting the lower Border of one with the upper Border of the next below it.
- 20 Inter-transverse Ligaments.
- 21 These thin and Membranous-like Ligaments exist chiefly in the Dorsal Vertebrae.

ARTICULATIONS OF THE CRANIUM.

- 22 The anterior (Occipito-atloid) Ligament, the posterior (Occipito-atloid) Ligament, and two Capsular Ligaments.
- 23 From the Basilar Process of the Os Occipitis, in front of the Foramen Magnum to the Body and anterior Tubercle of the Atlas.
- 24 Unlike the anterior it extends from the margin of the Os Occipitis, *behind* the Foramen Magnum to the anterior arch of the Atlas.

- 25 The Vertebral Artery and posterior primary Branch of the first Spinal Nerve.
- 26 Between the Condyles of the Os Occipitis and the upper articular processes of the Atlas.
- 27 The Central or Occipito-Axoidean Ligament and the lateral Odontoid, Alar, or Check Ligaments.
- 28 This broad band extends from the Basilar Process of the Os Occipitis to the Body of the Axis.
- 29 These two short and strong Fasciculi (one on either side), are attached by one extremity to the apex of the Odontoid Process, and by the other to a depression on the inner surface of the Condyles of the Os Occipitis.

ATLAS WITH THE AXIS.

- 30 The anterior (Atlo-axoid) Ligament, the posterior (Atlo-axoid) Ligament, the Transverse Ligament, (within the Spinal Canal), and two Capsular Ligaments.
- 31 From the anterior Tubercle and arch of the Atlas to the corresponding portion of the Body of the Axis.
- 32 From the posterior arch of the Atlas to the corresponding portion of the arch of the Axis.
- 33 This strong Fibrous Band crosses the Atlas behind the Odontoid Process, extending from a small Tubercle on the inner surface of the Atlas, to a similar one on the opposite side of the same Bone.
- 34 To keep the Processus Dentatus or tooth-like process of the Axis in its proper sphere.

TEMPORO-MAXILLARY ARTICULATION.

- 35 The external and internal lateral Ligaments, Capsular, Inter-articular Fibro-cartilage, a Stylo-maxillary Ligament, and two Synovial Membranes.
- 36 This short thick Band extends from the Tubercle at the Root of the Zygoma to the outer surface of the Neck of the lower Jaw.
- 37 This thin Membranous Band has no connection with the Joint, it extends from the apex of the Spinous Process of the Sphenoid Bone and Vaginal Process of the Temporal Bone to the Dental Foramen in the lower Jaw.
- 38 The Mylo-hyoid Branch of the inferior Dental Nerve.
- 39 The internal Maxillary Artery and inferior Dental Artery and Nerve.
- 40 This thin Membranous Band extends from near the apex of the Styloid Process to the lower Border of the Ramus of the Jaw.

- 41 Between the Masseter and internal Pterygoid Muscles.
- 42 The Parotid and Sub-maxillary Glands.
- 43 This thin oval Plate, Concavo-convex superiorly and moulded inferiorly to the convexity of the Condyle, is situated between the articular surfaces of the Bones.
- 44 Some Fibres from the external Pterygoid Muscle.

ARTICULATIONS OF THE TRUNK.

- 45 The Costo-vertebral or Stellate Ligament, Interarticular Ligament, and two Synovial Membranes.
- 46 The first, eleventh, and twelfth.
- 47 The anterior, middle, and posterior Costo-transverse Ligaments.
- 48 The anterior Costo-transverse Ligaments.
- 49 The first Rib.
- 50 The anterior and posterior Costo-sternal, the superior and inferior Costo-sternal and Synovial Membranes.
- 51 The Lumbo-sacral and the Lumbo-iliac Ligaments.
- 52 From the Transverse Process of the last Lumbar Vertebra to the lateral Border at the base of the Sacrum.
- 53 From the apex of the Transverse Process of the last Lumbar Vertebra to the posterior extremity of the Iliac Crest.

ARTICULATIONS OF THE PELVIS.

- 54 The anterior and posterior Sacro-iliac Ligaments, another longer than the rest is described as the oblique or long posterior Sacro-iliac Ligament, which descends to the third division of the Sacrum.
- 55 The anterior or short and the posterior or long, Sacro-ischiatic Ligaments.
- 56 The greater Sacro-sciatic Foramen.
- 57 The lesser Sacro-sciatic Foramen.
- 58 By its broad extremity to the side of the Sacrum and Coccyx, from which it passes outwards to the Ischial Spine of the Hip-bone.
- 59 From the side of the Sacrum and Coccyx to the inner Border of the Ischial Tuberosity.
- 60 The anterior and posterior Sacro-Coccygeal Ligaments.
- 61 The anterior and superior Pubic Ligaments, the Sub-pubic Ligament, and an Inter-fibro-Cartilage.
- 62 The upper boundary of the Pubic arch.
- 63 Not a Ligament of articulation, being merely a Tendino-fibrous Membrane, stretched across the Thyroid or Obturator Foramen.
- 64 The two Obturator Muscles, (internal and external).

65 The Obturator Artery and Nerve.

SECTION XII.—LIGAMENTS OF THE UPPER EXTREMITY.

- 1 The anterior and posterior Sterno-clavicular, the Inter-clavicular Ligament, the Costo-clavicular or Rhomboid Ligament.
- 2 Above the Sternum, from the extremity of one Clavicle to that of the other.
- 3 From the Tubercle on the under surface of the Sternal end of the Clavicle to the Cartilage of the first Rib.
- 4 The superior and inferior Acromio-clavicular Ligaments, the Coraco-clavicular Ligament, Interarticular-fibro-cartilage; and two Synovial Membranes.
- 5 Two parts, an anterior and a posterior, the former is called the Trapezoid Ligament, and the latter the Conoid Ligament.
- 6 The posterior or Coracoid Ligament, and the anterior or Coraco-acromial Ligament.
- 7 This round Ligament which crosses the Notch or Supraspinal Fossa in the upper Border of the Scapula, and converts it into a Foramen, extends from the base of the Coracoid Process to the Costa, posterior to the Notch.
- 8 The Supra-scapular Nerve, which is derived from the Brachial Plexus.
- 9 This triangular Ligament is attached by its apex to the tip of the Acromion Process, and by its base to all the external Border of the Coracoid Process.
- 10 Because of their attachment from one portion to another portion of the Bone.
- 11 The Coraco-humeral or Accessory Ligament, the Capsular and Glenoid Ligament, and Synovial Membrane.
- 12 From the base of the Coracoid Process to the greater Tuberosity of the Os Humeri.
- 13 This Fibro-cartilaginous Band surrounds the margin of the Glenoid Fossa.
- 14 The internal and external lateral Ligaments, the anterior and posterior Ligaments.
- 15 This roundish Band extends from the outer Condyle of the Humerus to the Orbicular Ligament around the Head of the Radius.
- 16 This triangular Layer extends from the inner Condyle of the Humerus to the Border of the greater Sigmoid Cavity of the Ulna.
- 17 The Ulnar Nerve is in contact with it posteriorly.

- 18 From the anterior surface of the upper part of the Humerus to the anterior part of the Coronoid Process of the Ulna and the Orbicular Ligament.
- 19 The Brachialis Anticus.
- 20 From the posterior surface of the Humerus above the Olecranon Fossa to the anterior part of the base of the Olecranon.
- 21 The Triceps.
- 22 The Annular or Orbicular Ligament, Synovial Membrane, Interosseous Ligament, and round Ligament.
- 23 This strong band which surrounds the Head of the Radius is attached by each extremity to the anterior and posterior Borders of the lesser Sigmoid Cavity.
- 24 This broad, thin, fibrous layer, is attached to the contiguous margins of the Ulna and Radius, forming a partial Septum between the anterior and posterior Muscles of the Forearm.
- 25 The anterior Interosseous which is derived from the Ulnar Artery.
- 26 This Ligament, sometimes called Oblique, extends from the base (in front) of the Coronoid Process of the Ulna to the Radius below its Tubercle.
- 27 The anterior-inferior and posterior-inferior Ligaments, the triangular Fibro-cartilage, and Synovial Membrane called "Membrana Sacciformis."
- 28 This Cartilage, in place of a Ligament, is attached to the Ridge on the inner surface of the Styloid Process of the Ulna by its apex, and by its base to the edge of the Radius.
- 29 The internal and external lateral Ligaments and the anterior and posterior Ligaments.
- 30 From the Styloid Process of the Ulna to the two inner Bones of the first row of the Carpus, (Os Cuneiforme et Pisiforme).
- 31 From the Styloid Process of the Radius to the upper part of the Os Scaphoides.
- 32 This thin Membranous Layer extends from the lower part of the Radius to the three outer Bones of the first row of the Carpus, (Os Scaphoides, Os Semi-lunare, and Os Cuneiforme).
- 33 This thin Membranous Layer extends from the lower end of the Radius to the first row of the Carpus.
- 34 Dorsal, Palmar, Interosseous, and the anterior Annular Ligament, also five Synovial Membranes.

- 35 This Ligament forms an arch over the anterior surface of the Carpus, its Fibres intervening between the two rows.
- 36 One on either side the Radial and Ulnar Borders of the Carpus.
- 37 This Ligament connects the Trapezium with the Scaphoid Bone.
- 38 This Ligament connects the Cuneiform with the Unciform Bone.
- 39 Dorsal, Palmar, and Interosseous, and two Synovial Membranes.
- 40 The lateral Ligaments, and the inferior or anterior Ligament, and Synovial Membrane.
- 41 The lateral and inferior or anterior Ligament and Synovial Membrane.

SECTION XIII.—LIGAMENTS OF THE LOWER
EXTREMITY.

- 1 Into those of the Hip, Knee, Ankle, and Foot.
- 2 The Capsular, Ilio-femoral, Cotyloid, Transverse, Inter-articular, (vel Ligamentum Teres), and a Synovial Membrane.
- 3 A strong Band of Fibres in front of the Capsular Ligament, which extends from the anterior-inferior Iliac Spine to the anterior Intertrochanteric line of the Femur.
- 4 A Band of Fibro-cartilage which surrounds the margin of the Acetabulum.
- 5 By the prolongation of the Fibres of the Cotyloid Ligament across the Notch of the Acetabulum, and which converts the Notch into a Foramen.
- 6 An articular Branch from the internal circumflex, also one from the Obturator Artery; the former derived from the Profunda, and the latter from the internal Iliac.
- 7 This somewhat triangular-shaped Ligament is attached by its apex to the pit in the Head of the Femur, and by its base to the two lips of the Notch in the Cotyloid Cavity.
- 8 The Capsular, external and internal lateral Ligament, posterior Ligament (or Ligament of Winslow), anterior Ligament, (vel Ligamentum Patellæ), the Crucial Ligaments, (one anterior or external, the other posterior or internal), two Inter-articular or Semi-lunar

Fibro-cartilages (one internal, the other external), the Transverse Ligament, also a Synovial Membrane.

- 9 This strong cord-like Ligament extends from the outer Condyle of the Femur, behind the Tubercle, to the outer part of the Head of the Fibula, this Ligament is sometimes called the long external lateral Ligament, in contradistinction to one which sometimes exists behind it, and called the short external lateral Ligament.
- 10 This broad Ligamentous Layer extends from the Tubercle on the inner Condyle of the Femur to the inner Tuberosity of the Tibia, on its posterior Border.
- 11 Chiefly by the Tendinous Fibres of the Semimembranosus Muscle.
- 12 The Ligamentum Patellæ of the Extensor Muscles of the Thigh, it is erroneously called a Ligament, being only a prolongation of the common Extensor Tendon.
- 13 A Bursa Mucosa.
- 14 From the depression in front of the Spine of the Tibia to the posterior part of the external Condyle of the Femur, on its inner surface.
- 15 From the depression behind the Spine of the Tibia to the inner Condyle of the Femur.
- 16 Oval.
- 17 Circular.
- 18 This narrow band is situated in front of the Joint between the two Interarticular Cartilages.
- 19 The anterior and posterior Ligaments and the Interosseous Ligament.
- 20 From the inner Tuberosity of the Tibia to the anterior part of the Head of the Fibula.
- 21 From the corresponding parts upon the posterior surface of the Joint.
- 22 This broad, thin, fibrous Layer is attached to the contiguous margins of the Tibia and Fibula, forming a partial Septum between the anterior and posterior Muscles of the Leg.
- 23 The anterior Tibial Artery, which forms one of the divisions of the Popliteal Artery.
- 24 The anterior Peroneal Branch, which according to some Anatomists is derived from the Peroneal or Fibular Artery.
- 25 The anterior and posterior Ligaments and the inferior or Transverse Ligament.

- 26 This Ligament crosses the anterior Aspect of both Bones, projecting a little below their extremities.
- 27 From the corresponding parts upon the posterior surface of the Joint.
- 28 This Ligament consists of Transverse yellow Fibres, which pass posterior to the Joint between the two Malleoli.
- 29 The anterior or Tibio-tarsal Ligament, the posterior, and the internal and external lateral Ligaments.
- 30 This thin Membranous Layer extends from the margin of the Tibia to the upper part of the Astragalus.
- 31 This triangular Layer is attached by its apex or upper part to the inner Malleolus, and by its base to the Astragalus, Os Calcis, and Scaphoid Bone.
- 32 This strong Ligament, which consists of three Fasciculi, arises from the fore part and inner surface of the outer Malleolus, and inserted as follow: the anterior piece passes forward to the Astragalus, the middle piece to the outer surface of the Os Calcis, and the posterior piece to the posterior part of the Astragalus.

ARTICULATIONS OF THE TARSUS.

- 33 The posterior, external, and Interosseous Ligaments, also two Synovial Membranes.
- 34 The Dorsal vel Astragalo-scaphoid Ligament.
- 35 The inferior vel Calcaneo-scaphoid Ligament, and the external Calcaneo-scaphoid Ligament.
- 36 The Dorsal vel superior Calcaneo-cuboid, the inferior Calcaneo-cuboid Ligament, (which consists of two parts, superficial and deep), an Interosseous Ligament, and a Synovial Membrane.
- 37 The three Dorsal Ligaments, and the Tendinous processes of the Tibialis Posticus Muscle, also a Synovial Membrane.
- 38 A Dorsal, Plantar, and Interosseous Ligament.
- 39 Dorsal and Interosseous Ligaments, and a Plantar Ligament between the two inner Cuneiform Bones, also Synovial Membrane.
- 40 A Dorsal, Plantar, and Interosseous Ligament.

ARTICULATIONS OF THE METATARSAL BONES.

- 41 The four outer.
- 42 Dorsal, Plantar, and Interosseous Ligaments.
- 43 The Transverse Metatarsal Ligaments.
- 44 Two lateral and an inferior or anterior Ligament to each Joint, also a Synovial Membrane to each.

ARTICULATIONS OF THE PHALANGES.

- 45 Two lateral and an inferior or anterior Ligament to each Joint.

SECTION XIV.—MYOLOGY.

- 1 The doctrine of the Muscles.
- 2 Muscles are the fleshy bodies composed of parallel Contractile Fibres with Tendinous extremities.
- 3 Those glistening, fibrous, firm, and compact Cords, by which the Muscles are attached to the surfaces of Bones.
- 4 If the Fibres run longitudinally and terminate in Tendon, they are said to be simple or Fusiform in shape; if they diverge from a Tendinous centre, like a Fan, they are said to be Radiated—*e.g.*, the Temporal, Pectoral, &c.; if they have a feathery arrangement and converge to one side of a Tendon, they are said to be Penniform, as the Peronei; and if they converge to both sides of a Tendon, they are said to be Bipenniform, *e.g.*, Dorsales Interossei Manûs.
- 5 The Abdominal Muscles.
- 6 Some are named from their uses, as Flexors and Extensors, Levators, and Depressors, &c.; some from their form, as Trapezius, Rhomboideus, &c.; some from their direction, as Rectus Transversalis, &c.; some from their points of attachment, as Sterno-cleido-mastoideus, Sterno-hyoid; some from their situation as Occipito-frontalis, Pectoralis; others from their divisions, as Biceps, Triceps, &c.
- 7 The least moveable point of attachment is called its Origin.
- 8 The most moveable point of attachment is called the Insertion.

MUSCLES OF THE HEAD, FACE, AND NECK.

- 9 Into six Regions, viz.: the Cranial, Orbito-ocular, Nasal, superior and inferior Labial, Pterygo-maxillary, and Auricular.

CRANIAL REGION.

- 10 Two; the Occipito-frontalis, on either side.
- 11 This Musculo-tendinous expansion or Layer, consists of two parts, with an intervening Aponeurosis:—the Fibres at its anterior or Frontal portion arise in conjunction with those of the Orbicularis Palpebrarum, and Corrugator Supercilii, and passing upwards are

inserted in the Epicranial Aponeurosis, somewhat below the level of the Coronal Suture: the Fibres of the posterior or Occipital portion, arise from the outer half of the upper curved line of the Occipital Bone and Mastoid portion of the Temporal Bone, and passing upwards are inserted in the Cranial Aponeurosis: its action or use is to raise the Eyebrows, and wrinkle the Integument of the Forehead transversely.

- 12 Just above the Root of the Nose.

ORBITO-OCULAR REGION.

- 13 Ten; Orbicularis Palpebrarum, Corrugator Supercilii, Tensor Tarsi, Levator Palpebræ Superioris, Rectus superior, inferior, Internus et Externus, Obliquus Superior et Inferior.
- 14 Orbicularis Palpebrarum, Corrugator Supercilii, and Tensor Tarsi.
- 15 The Orbicularis Palpebrarum arises from the internal angular process of the Frontal Bone, the Nasal Process of the upper Maxillary Bone and from the Tendo Oculi, and is inserted into the same parts from which it arose: its action is to close the Eye-lid and assist in conveying the Tears towards the Puncta Lachrymalia.
- 16 The Corrugator Supercilii arises from the inner extremity of the Superciliary Ridge of the Frontal Bone, and is inserted or becomes blended with the Fibres of the preceding Muscle, about the middle of the Orbital arch: its action is to draw the Eyebrows together, and wrinkle the Integument of the Forehead longitudinally.
- 17 The Tensor Tarsi arises from the small Ridge on the Orbital Plate of the Os Unguis vel Lachrymale, and passing over the Lachrymal Sac divides into two slips which lie in the Lachrymal Canals and are inserted in the Tarsal Cartilage.
- 18 The Levator Palpebræ Superioris arises from the upper margin of the Optic Foramen, and Fibrous Sheath of the Optic Nerve; and is inserted into the fore part and upper Border of the Tarsal Cartilage; its action is to raise the Eyelid.
- 19 The Rectus Superior arises like the preceding Muscle from the upper margin of the Optic Foramen and Fibrous Sheath of the Optic Nerve; and is inserted into the Sclerotic Coat at the upper surface of the Globe of the Eye.

- 20 The Rectus Inferior arises from the Tendon common to it, the internal and external Rectus and the Fibrous Sheath of the Optic Nerve, and is inserted into the Sclerotic Coat at the under surface of the Globe of the Eye, about a quarter of an inch from the margin of the Cornea.
- 21 The Rectus Internus arises from the common attachment and Fibrous Sheath of the Optic Nerve, and is inserted into the Sclerotic Coat at the inner surface of the Globe of the Eye, about a quarter of an inch from the margin of the Cornea.
- 22 The Rectus Externus arises by two Heads (an upper and a lower), the upper (with the Rectus Superior), from the upper margin of the Optic Foramen, and the lower (with the Rectus Inferior) from the common Tendon, and from the lower margin of the Sphenoidal Fissure near to the inner end, and is inserted into the Sclerotic Coat on the outer surface of the Ball of the Eye, about a quarter of an inch from the margin of the Cornea.
- 23 The Nasal Branch of the Ophthalmic Nerve, and the third and sixth Nerves; also the Ophthalmic Vein.
- 24 The Obliquus Superior arises from the inner margin of the Optic Foramen and Fibrous Sheath of the Optic Nerve, and is inserted into the Sclerotic Coat behind the middle of the Eyeball, near the entrance of the Optic Nerve.
- 25 The Obliquus Inferior arises from the inner margin of the upper Maxillary Bone, external to the Lachrymal Groove, and is inserted into the Sclerotic Coat at the outer and posterior part of the Globe of the Eye, between the external Rectus and the superior Rectus.

NASAL REGION.

- 26 *Pyramidalis Nasi*, *Compressor Naris*, *Levator Alæ Nasi*, and *Depressor Alæ Nasi*.
- 27 The *Pyramidalis Nasi* is a small slip of Muscular Fibres which appears as a prolongation of the *Occipito-frontalis Muscle*, and is inserted into the Aponeurosis common to the *Compressor Naris*.
- 28 *Triangular*, and arises by its apex or point from the *Canine Fossa* of the upper Maxillary Bone, and is inserted into the Aponeurosis common to its fellow of the opposite side.

- 29 This Muscle arises from the upper extremity of the Nasal Process of the upper Maxillary Bone, and divides into two Fasciculi, the inner is inserted into the Ala or Wing of the Nose, and the other prolonged into the upper Lip, becomes blended with the Orbicularis Oris.
- 30 This Muscle arises from the Incisive Fossa of the upper Maxillary Bone, anterior to the Roots of the second Incisor and Canine Teeth, and is inserted into the Septum and posterior part of the Ala or Wing of the Nose and the upper Lip.

SUPERIOR AND INFERIOR LABIAL REGION.

- 31 Orbicularis Oris, Levator Labii Superioris (Proprius), Levator Anguli Oris, Zygomaticus Major et Minor, the Buccinator, Depressor Labii Inferioris, Depressor Anguli Oris, and Levator Labii Inferioris.
- 32 This Muscle completely surrounds the external opening of the Mouth, its Concentric Fibres consist of two parts an inner and outer, the inner Fibres are free and unattached to Bone, the outer are attached to the subjacent Bone and Muscles.
- 33 From the superior Maxillary and Malar Bones, immediately above the Infra-orbital Foramen, and is inserted into the Integument of the upper Lip.
- 34 From the Canine Fossa of the upper Maxillary Bone, immediately below the Infra-orbital Foramen, and is inserted into the angle of the Mouth, its fibres becoming blended with those of the Depressor Anguli Oris, the Zygomatici and Orbicularis.
- 35 From the outer part of the Malar Bone at its union with the Temporal Bone, and is inserted into the angle of the Mouth.
- 36 From the anterior and inferior part of the Malar Bone, and is inserted into the angle of the Mouth, its fibres becoming blended with those of the proper elevator of the upper Lip.
- 37 The Buccinator arises from the external surface of the Alveolar Borders of the Maxillary Bones, extending on either side from the first Molar Tooth to the last, it is also attached in the interval between the Maxillæ to a Tendinous Band, called the Pterygo Maxillary Ligament, the fibres of insertion then converge to the angle of the Mouth, where they become blended with the other Muscles, and the two parts, (inner and outer), of the Orbicularis.

- 38 From the depression or oblique line by the side of the Symphysis of the inferior Maxilla, and is inserted into the Integument of the lower Lip with the Orbicularis Muscle.
- 39 By a broad surface from the external oblique line on the inferior Maxilla, and is inserted by its apex into the angle of the Mouth, where it is blended with the fibres of the Elevator Muscles.
- 40 From the Incisive Fossa, a little below the Alveolar Border of the inferior Maxilla, (near its Symphysis), and is inserted into the Integument of the Chin.

PTERYGO-MAXILLARY REGION.

- 41 The Masseter, Temporalis, Pterygoideus Externus et Internus.
- 42 The Masseter consists of two portions, divided by an Aponeurosis, superficial and deep, the superficial arises from the anterior two-thirds of the lower Border of the Zygomatic Process of the Temporal Bone and Malar Bone, and is inserted into the angle and lower half of the outer surface of the Ramus of the inferior Maxilla. The deep portion arises from the remaining third and posterior part of the Zygomatic Process, and is inserted into the upper half of the Ramus and external surface of the Coronoid Process of the inferior Maxilla.
- 43 The Parotid Gland, Stenon's Duct, the Transverse Facial Artery and Nerve.
- 44 The Temporalis arises from the whole surface of the Temporal Fossa and Temporal Fascia, and is inserted into the inner surface and apex of the Coronoid Process to near the last Molar Tooth.
- 45 This Muscle arises by two Heads, one from the Pterygoid Ridge on the greater Wing of the Sphenoid Bone, below its Crest; the other from the outer surface of the external Pterygoid Plate, and from the Tuberosity of the Palate Bone and that of the upper Maxilla, and are inserted into the hollow in the anterior part of the Neck of the inferior Maxilla, and into the Inter-articular Fibro-cartilage.
- 46 One of the terminal Branches of the external Carotid, viz. : the internal Maxillary Artery.
- 47 From the Pterygoid Fossa & internal surface of the external Pterygoid Plate, and is inserted into the angle and internal surface of the Ramus of the inferior Maxilla

- 48 The Masseter Muscle, and called by Winslow the internal Masseter. AURICULAR REGION.
- 49 Attollens Aurem (vel Superior Auris), Attrahens Aurem (vel Anterior Auris), Retrahens Aurem (vel Posterior Auris).
- 50 From the Tendon of the Occipito-frontalis, and is inserted into the upper and anterior part of the Pinna or Cartilage of the Ear.
- 51 From the anterior part of the Tendon of the Occipito-frontalis, and is inserted into the anterior part of the Concha.
- 52 The Temporal Vessels, (anterior and posterior Arteries).
- 53 By two or three thin Fasciculi from the Root of the Mastoid Process, and are inserted into the posterior part of the Concha.
- 54 The posterior Auricular Artery and Nerve.

SECTION XV.—MUSCLES OF THE NECK.

- 1 Into eight Regions: the Superficial, Submaxillary, Genio-hyoid, Sterno-hyoid, Vertebral (anterior and lateral), Laryngeal, Pharyngeal, & Palatal Regions.

SUPERFICIAL REGION.

- 2 The Platysma Myoides & the Sterno-cleido-mastoideus.
- 3 The Platysma Myoides arises from the Clavicle and Acromion of the Scapula, and the Integument covering the Pectoralis Major and Deltoid Muscles, and passing upwards over the side of the Neck, is inserted into the external oblique Ridge and Symphysis of the inferior Maxilla, the angle of the Mouth and Cellular Tissue of the Face.
- 4 Between the two layers of the deep Cervical Fascia, it arises by two Heads, the inner Head from the fore part of the upper piece of the Sternum, and the other or outer Head from the Sternal third of the Clavicle, and is inserted into the base of the Mastoid Process of the Temporal Bone, and into the outer part of the superior curved line of the Occipital Bone.
- 5 The Spinal Accessory Nerve.

SUB-MAXILLARY REGION.

- 6 The Digastricus, Stylo-hyoideus, Stylo-glossus, and Stylo-pharyngeus.
- 7 The Digastricus (*Dis*, twice; and *Gaster*, belly), arises by two Origins; the posterior or longer Origin arises from the Digastric Fossa or Groove behind the Mastoid

Process of the Temporal Bone, the anterior by a slight depression from the inner side of the base of the inferior Maxilla, close to its Symphysis, and is attached with its fellow to an Aponeurotic expansion which is inserted into the body and part of the great Cornu of the Os-hyoides.

- 8 The Mylo-hyoid Muscle immediately under the Skin.
- 9 The Sterno-cleido-mastoid Muscle, and crosses the Carotid Arteries and Jugular Vein.
- 10 From the external surface of the Styloid Process of the Temporal Bone, and is inserted into the Os-hyoides at the union of the body with the great Cornu.
- 11 No.
- 12 From near the apex of the Styloid Process and the Stylo-maxillary Ligament, and is inserted into the substance of the Tongue.
- 13 From the inner surface of the base of the Styloid Process, descending between the superior and middle constrictors, and is inserted into the Pharynx and upper Border of the Thyroid Cartilage.
- 14 The Carotid Arteries.

GENIO-HYOID REGION.

- 15 Mylo-hyoideus, Genio-hyoideus, Genio-hyo-glossus, Hyo-glossus, and Lingualis.
- 16 From the Mylo-hyoidean or Molar Ridge on the inner surface of the body of the inferior Maxilla as far as the last Molar Tooth, and is inserted into the body of the Os Hyoides, and the Tendinous Raphe of the two Muscles.
- 17 From the lower of the two lateral Tubercles (inferior Sub-mental Tubercle), on the inner side of the Symphysis of the inferior Maxilla, and is inserted into the middle of the body of the Os Hyoides.
- 18 From the Tubercle above that of the last-named Muscle on the inner side of the Symphysis of the inferior Maxilla, and is inserted into the under surface of the Tongue, from the base to the apex, also into the body of the Hyoid Bone.
- 19 The Lingual or Hypo-glossal Nerve.
- 20 From the all length of the great Cornu and external surface of the body of the Hyoid Bone, and is inserted by two distinct parts into the back part and side of the Tongue, and by the third part into the upper surface of the Tongue, near its base.

- 21 The Basio-glossus, the Cerato-glossus, and the Chondro-glossus.
- 22 The Stylo-glossus and Lingualis.
- 23 From the Os Hyoides and is inserted into the apex of the Tongue, (passing longitudinally from base to apex).
- 24 The Hyo-glossus, and Genio-hyo-glossus.

STERNO-HYOID REGION.

- 25 Sterno-hyoideus, Sterno-thyroideus, Thyro-hyoideus, and Omo-hyoideus.
- 26 From the posterior and upper surface of the Sternum and Cartilage of the first Rib, and occasionally the inner extremity of the Clavicle, and is inserted in the lower Border of the body of the Hyoid Bone.
- 27 From the posterior and upper surface of the Sternum, the Cartilage of the first Rib, and sometimes from that of the second Rib, and is inserted into the oblique line on the Ala or side of the Thyroid Cartilage.
- 28 This is a continuation of the preceding Muscle arising from the oblique line on the side of the Thyroid Cartilage, and is inserted into the great Cornu, and lower Border of the body of the Hyoid Bone.
- 29 This is a Digastric or double-bellied Muscle (an anterior and a posterior), arising from the upper Border of the Scapula and the Transverse Ligament, which converts the Notch into a Foramen (the Supra-scapular Notch), and is inserted into the lower Border of the body of the Os Hyoides close to the great Cornu.

PRÆVERTEBRAL REGION.

- 30 The Scalenus Anticus, Scalenus Medius, Scalenus Posticus, Rectus Lateralis, Rectus Capitis Anticus Major et Minor, and the Longus Colli.

LATERAL REGION.

- 31 From the Tubercle on the inner Border and upper surface of the first Rib, and is inserted into the anterior Tubercles of the Transverse Processes of four Cervical Vertebrae: third, fourth, fifth, & sixth.
- 32 From the inner Border of the first Rib, and from a Groove on its upper surface, and is inserted into the extremities of the posterior Transverse Processes of the six inferior Cervical Vertebrae.
- 33 From the upper Border of the second Rib, and is inserted in conjunction with the preceding Muscle, into the three inferior Cervical Vertebrae.

ANTERIOR REGION.

- 34 From the Transverse Process of the Atlas, and is inserted into the rough surface of the Os Occipitis, external to the Condyle.
- 35 From the anterior Tubercles of the Transverse Processes of four Cervical Vertebræ—third, fourth, fifth, & sixth, and is inserted into the Basilar Process of the Occipital Bone, anterior to the Foramen Magnum.
- 36 From the fore part of the lateral mass of the Atlas, and Root of its Transverse Process, and is inserted into the Basilar Process.
- 37 This Muscle consists of two parts, internal and external, the internal or lower part arises from the bodies of the two upper Dorsal and two lower Cervical Vertebræ; the external part arises from the upper Border of the Transverse Processes of four Cervical Vertebræ, third, fourth, fifth, and sixth, and are inserted into the anterior Tubercle of the Atlas, and the lower Border of the bodies of the first four Cervical Vertebræ.

LARYNGEAL REGION.—*Larynx.*

- 38 The Larynx is the chief organ for the production of the Voice: it forms a permanently open passage for respiration, and gives attachment to Muscles.
- 39 At the upper and anterior part of the Neck, at the base of the Tongue, just below the Hyoid Bone.
- 40 Cartilages and Ligaments.

CARTILAGES OF THE LARYNX.

- 41 Thyroid, Cricoid, and the two Arytænoid Cartilages.
- 42 Pomum Adami.
- 43 Epiglottis, on either side of which is the Cuneiform Cartilage.
- 44 This (somewhat triangular) Fibro-cartilage, is situated in front of the opening of the Larynx, which it closes during the act of Deglutition, assuming a horizontal position; and during respiration it assumes a vertical position.
- 45 The opening into the Laryngeal Cavity.
- 46 These according to some Anatomists are divided into two groups, those which connect it to the Hyoid Bone and the Trachea, and those by which the several pieces are connected to each other.
- 47 The Crico-thyroideus, Crico-arytænoides Posticus, Crico-arytænoides Lateralis, Thyro-arytænoides, and the single one in the middle, the Arytænoides.

- 48 From the anterior and lateral part of the Cricoid Cartilage, and is inserted into the lesser Cornu, also the inferior and inner Border of the Thyroid Cartilage.
- 49 From the depression on the posterior aspect of the Cricoid Cartilage, and is inserted into a small projection at the outer part of the base of the Arytænoid Cartilage.
- 50 This Muscle is placed in the posterior concave surface of the Arytænoid Cartilages, it consists of two sets of Fibres, superficial and deep; the former extend from the base of one Cartilage to the apex of the other, and the latter are inserted into the outer and posterior surfaces of the Cartilages.
- 51 From the side of the upper Border of the Cricoid Cartilage, and is inserted with the Thyro-arytænoideus, into the projection at the outer part of the base of the Arytænoid Cartilage.
- 52 From the Thyroid Cartilage and Crico-thyroid Ligament, and is inserted with the fibres of the preceding Muscle into the base of the Arytænoid Cartilage.
- 53 From the anterior and upper part of the Arytænoid Cartilage, and inner surface of the Thyroid Cartilage, and is inserted into the Border of the Epiglottis.
- 54 The Thyro-epiglottideus, Arytæno-epiglottideus, superior et inferior.

PHARYNGEAL REGION.

Pharynx.

- 55 A Musculo-membranous Tube which extends from the centre of the base of the Skull, to a point opposite the fifth Cervical Vortebra, where it terminates in the Œsophagus.
- 56 Two posterior Nares, two Eustachian Tubes, Larynx, Mouth, and Œsophagus.
- 57 The inferior, middle, and superior Constrictors.
- 58 From the outer surface of the Cricoid Cartilage, from the oblique Ridge, and the upper and lower Borders of the great Ala of the Thyroid Cartilage, and is inserted with the fibres of its fellow in the Raphe of the middle of the Pharynx.
- 59 From the greater and lesser Cornua of the Os Hyoides and the Stylo-hyoidean Ligament, and is inserted with the fibres of its fellow along the middle line of the Pharynx; also by a Tendinous Aponeurosis into the Basilar Process of the Os Occipitis.

- 60 From the Mylo-hyoidean Ridge of the inferior Maxilla, the lower third of the inner surface of the internal Pterygoid Plate, and from the Pterygo-maxillary Ligament, and is inserted into the Raphe along the middle line, also by the Tendinous Aponeurosis into the Basilar Process of the Os Occipitis.

PALATAL REGION.

- 61 The Levator Palati, Tensor Palati, Palato-glossus, Palato-pharyngeus, and Azygos Uvulæ.
- 62 From the apex of the Petrous portion of the Temporal Bone, and the inner and under part of the Cartilage of the Eustachian Tube, and is inserted with its fellow of the opposite side along the middle line.
- 63 From the small depression, the Scaphoid or Navicular Fossa, at the base of the internal Pterygoid Plate of the Sphenoid Bone, the outer part of the Eustachian Tube, the Spinous Process of the Sphenoid, the Tympanic or Vaginal Process of the Temporal, and is inserted by its Tendinous Aponeurosis into the slight Transverse Ridge on the inferior surface of the horizontal Plate of the Palate Bone and the Raphe.
- 64 From the anterior surface of the soft Palate, and is inserted into the side and Dorsum of the Tongue.
- 65 From the side of the soft Palate, and is inserted inferiorly into the posterior Border of the Thyroid Cartilage.
- 66 From the Spine at the posterior Border of the horizontal Plate of the Palate Bone, and is inserted in the tip of the Uvula.
- 67 Uva, and by other ancient Anatomical writers, Columella.

SECTION XVI.—MUSCLES OF THE TRUNK.

- 1 Into four Regions; those of the Back, Thorax, Abdomen, and Perineum.
- 2 Into six, and according to some Anatomists, five Layers.
- 3 The Trapezius and Latissimus Dorsi.
- 4 From the Spinous Processes of the last Cervical and all the Dorsal Vertebrae, the Supra-spinous Ligament, the Ligamentum Nuchæ, and from the inner third of the superior curved line of the Os Occipitis, and is inserted into the posterior surface of the Scapular third of the Clavicle, the posterior Border of the Acromion Process of the Scapula, and along the upper Border of the Spine of the Scapula.
- 5 The Deltoid Muscle.

- 6 From the Spinous Processes of the six inferior Dorsal Vertebrae, all the Lumbar and two upper Sacral Spinous Processes, the Supra-spinous Ligament, the outer Border of the posterior half of the Crest of the Ilium, and by fleshy Processes from three or four of the lower Ribs, and crossing the inferior angle of the Scapula, is inserted into the bottom of the Bicapital Groove of the Humerus.
- 7 Levator Anguli Scapulae, Rhomboideus Major et Minor.
- 8 From the posterior Tubercles or tips of the Transverse Processes of the three or four upper Cervical Vertebrae, and is inserted into the base of the Scapula between the upper angle and Spine.
- 9 From the Spinous Processes of four and sometimes five upper Dorsal Vertebrae and the Supra-spinous Ligament, and inserted into the base of the Scapula between its inferior angle and Spine.
- 10 From the Spinous Processes of the last Cervical and first Dorsal Vertebrae and the Ligamentum Nuchae, and is inserted into the base of the Scapula opposite the triangular surface on its posterior Border.
- 11 Serratus Posticus, Superior et Inferior, and Splenius.
- 12 From the Ligamentum Nuchae, the Spinous Processes of the last Cervical, and two and sometimes three upper Dorsal Vertebrae, and is inserted by three slips or Processes into the upper Border of the second, third, and fourth Ribs, external to their angles.
- 13 From the Spinous Processes of the two last Dorsal and three upper Lumbar Vertebrae, and is inserted by four slips or Processes into the lower Border of the four last Ribs, anterior to their angles.
- 14 This Muscle consists of two parts, viz. : Splenius Colli et Splenius Capitis, the Splenius Colli arises from the Spinous Processes of the six upper Dorsal Vertebrae, and is inserted into the posterior Tubercles or tips of the Transverse Processes of the three upper Cervical Vertebrae; the Splenius Capitis arises from the Spinous Processes of the last Cervical, and two upper Dorsal Vertebrae and the Ligamentum Nuchae, and is inserted into the rough surface of the Os Occipitis between the two curved lines; also the apex & external surface of the Mastoid Process of the Temporal Bone.
- 15 The Spinalis Dorsi, Erector Spinæ (vel Sacro-lumbalis et Longissimus Dorsi), and Complexus.

- 16 From the Spinous Processes of the two upper Lumbar and two lower Dorsal Vertebræ, and the adjoining Tendon of the Longissimus Dorsi, and is inserted into the Spinous Processes of the upper Dorsal Vertebræ, from the first to eighth.
- 17 The Sacro-lumbalis vel Ilio-Costalis, and the Longissimus Dorsi.
- 18 From the posterior third of the Crest of the Ilium, posterior surface of the Sacrum, the Transverse Processes and Tubercles of the Lumbar Vertebræ, and the Fascia Lumborum, external to those Processes, and is inserted by separate Tendons into the angles of the six inferior Ribs.
- 19 A prolongation of the preceding Muscle from the angles of the six inferior Ribs, and is inserted into the angles of the six upper Ribs, and the Transverse Process of the last Cervical Vertebra.
- 20 A prolongation of the Musculus Accessorius into the Neck arising from the angles of the third, fourth, fifth, and sixth Ribs, and inserted into the posterior Tubercles of the Transverse Processes of the three lower Cervical Vertebræ.
- 21 From a common origin with the Sacro-lumbalis, and divides opposite the last Rib, and is inserted internally into the tips of the Transverse Processes of all the Dorsal Vertebræ, and externally into all the Ribs except the two first; between their Tubercles and angles.
- 22 A prolongation into the Neck of the Longissimus Dorsi, arising from the Transverse Processes of the upper six Dorsal Vertebræ, and is inserted into the posterior Tubercles of the Transverse Processes of all the Cervical Vertebræ, the first and last excepted.
- 23 A prolongation into the Neck of the Longissimus Dorsi, arising from the Transverse Processes of four or five upper Dorsal Vertebræ; also the Articular processes of the last four Cervical Vertebræ, and is inserted beneath the Splenius Capitis, into the posterior part of the Mastoid Process near the Digastric Fossa.
- 24 From the Transverse Processes of the last Cervical and six upper Dorsal Vertebræ, also the Articular processes of the four inferior Cervical Vertebræ, and is inserted into the rough impression between the two curved lines of the Os Occipitis, near to its Spine.

- 25 A portion of the preceding Muscle on its inner side, and so named from its having two fleshy Bellies with a central Tendon.
- 26 The Rectus Posticus Major et Minor, Obliquus Inferior et Superior, and the Semi-spinales.
- 27 From the side of the Spinous Process of the Axis, and is inserted into the outer part of the inferior curved line of the Os Occipitis.
- 28 From the Spinous Process or rather the posterior Tubercle of the Atlas, and is inserted into the inferior curved line of the Os Occipitis, and between this ridge and the Foramen Magnum.
- 29 From the Spinous Process of the Axis, and is inserted into the extremity of the Transverse Process of the Atlas.
- 30 At the termination of the preceding Muscle, and is inserted into the rough impression between the two curved lines of the Os Occipitis, near the Mastoid Process.
- 31 From the Transverse Processes of the sixth, seventh, eighth, ninth, and tenth Dorsal Vertebrae, and is inserted into the Spinous Processes of the four upper Dorsal and two last Cervical Vertebrae.
- 32 From the Transverse Processes of four or five upper Dorsal Vertebrae and articular processes of the fourth, fifth, sixth, and seventh Cervical Vertebrae, and is inserted into the Spinous Processes of the second, third, fourth, and fifth Cervical Vertebrae.
- 33 The Inter-spinales, Multifidus Spinæ, Inter-transversales, and Levatores Costarum.
- 34 These Muscles, as their name implies, are placed between the Spinous Processes of the adjoining pairs of Vertebrae, they exist in the three Regions, viz.: the Cervical, Dorsal, and Lumbar, but not so distinct in the two last-named Regions, in the Cervical Region they are well observed, attached above and below to the Bifid extremities of the Spinous Processes, except between the first and second Cervical Vertebrae.
- 35 These fleshy Fasciculi extend from the Sacrum to the second Vertebra; in the Lumbar Region each Fasciculus arises from the accessory and articular processes of the Lumbar Vertebrae; in the Dorsal from the Transverse Processes of the corresponding Vertebrae, and in the Cervical from the articular processes of

- four or five inferior Cervical Vertebæ, and are inserted in the Spinous Processes of all the Vertebæ, between the Atlas and last Sacral Vertebra.
- 36 These Muscles are described as existing in the Cervical, Dorsal, and sometimes the Lumbar Regions; in the Cervical they occupy the intervals between the Transverse Processes, and composed of seven pairs; in the Dorsal they are single and occupy the intervals between the Transverse Processes of the last four or five Dorsal Vertebæ.
- 37 These Muscles, twelve on either side, arise each, except the first, from the apex and lower Border of the Transverse Process of a Dorsal Vertebra, and is inserted into the rough impression along the upper Border of the Rib below; between the Tubercle and angle.
- 38 From the Transverse Process of the last Cervical Vertebra, and is inserted into the outer surface of the first Rib.

MUSCLES OF THE THORAX.

- 39 The Intercostales Externi et Interni and the Triangularis Sterni.
- 40 Eleven on either side.
- 41 An external Intercostal Muscle is fixed to the outer margin of each pair of Ribs; extending from the Tubercles to near the external extremity of their Cartilages.
- 42 Eleven on either side.
- 43 An internal Intercostal Muscle is fixed to the inner margin or Border of each pair of Ribs; extending between the true Ribs from the Sternum, and in the rest from the anterior extremities of their Cartilages to the angles of the Ribs.
- 44 Within the cavity of the Thorax immediately behind the Costal Cartilages.
- 45 From the inner surface of the Xiphoid or Ensiform Cartilage, lower third of the Sternum, and from the Sternal extremities of three or four Costal Cartilages, and is inserted, by fleshy Digitations, into the second, third, fourth, and fifth true Ribs, at the union of the Bone and Cartilage; also into the Aponeurosis in the Intercostal spaces.
- 46 The Transversalis Abdominis.

MUSCLES OF THE ABDOMEN.

- 47 Obliquus Externus et Internus, Cremaster, Transversalis, Rectus, Pyramidalis, Quadratus Lumborum, Psoas Parvus and Diaphragm.

- 48 By fleshy points from the anterior surfaces of the eight lower Ribs, the upper five alternate with corresponding processes of the Serratus Magnus, and the three lower with those of the Latissimus Dorsi, and is inserted by a broad Aponeurosis into the anterior half of the outer Lip of the Crest of the Ilium, and the other insertion on the front of the Belly, corresponding to the anterior-superior Spinous Process of the Ilium, Pectineal line, Spine and front of Os Pubis, and Linea Alba.
- 49 This is the middle flat Muscle of the Abdomen, and reverse to the preceding Muscle, viz. : Aponeurotic above and fleshy below, it arises from the external half of Poupart's Ligament, the anterior two-thirds of the middle of the Crest of the Ilium and the Fascia Lumborum, and is inserted into the Crest of the Os Pubis, Pectineal Line, Linea Alba, and the lower Borders of the Cartilages of the four lower Ribs.
- 50 From the middle of Poupart's Ligament, from the lower Border of the internal Oblique, and by some Fibres from the Transversalis; the fibres from these origins pass downwards, and form a series of Loops on the Spermatic Cord, and become blended with the Tunica Vaginalis Testis, whilst the rest are inserted with the conjoined Tendon into the Pectineal line of the Os Pubis.
- 51 From the outer third of Poupart's Ligament, the anterior two-thirds of the Crest of the Ilium, from the Spinous and Transverse Processes of the Lumbar Vertebrae. In the Chest it takes origin by Tendon from the two inferior Ribs, and by fleshy Digitations from the under surfaces of the Cartilages of the seventh, eighth, ninth, and tenth Ribs, and is inserted with the lower fibres of the internal Oblique into the Pectineal line, and forming the conjoined Tendon or Aponeurosis of these two Muscles; its Aponeurosis is also continued into the Crest of the Os Pubis and Linea Alba.
- 52 The Transversalis Abdominis.
- 53 By two Tendinous Processes, the internal or smaller one arises from the front of the Symphysis Pubis, and the external one from the Crest of the same Bone, and is inserted by three fleshy Digitations into the Cartilages of the fifth, sixth, and seventh Ribs.

- 54 *Linæ Transversæ vel Inscriptiones Tendinæ.*
- 55 One at the Umbilicus, one at the Xiphoid Cartilage, and the third between the two.
- 56 This central or Tendinous line forms the bond of union of the Aponeuroses of opposite sides of the front of the Abdomen, extending from the Xiphoid Cartilage to the Pubes.
- 57 This line extends from the eighth Rib to the external part of the Crest of the Pubis, and corresponds with the outer Border of either Rectus Muscle.
- 58 Anteriorly for three-fourths of its extent, by the Aponeurosis of the external oblique, and the anterior Aponeurosis of the internal oblique; and posteriorly by the posterior Aponeuroses of the internal oblique, and Transversalis Muscles.
- 59 By its base from the Crest of the Os Pubis, anterior to the Rectus, and is inserted into the Linea Alba, midway between the Umbilicus and Pubes.
- 60 No.
- 61 From the Crest of the Ilium and the Ilio-Lumbar or Vertebral Ligament, and is inserted into the Transverse Processes of the four upper Lumbar Vertebrae, the body of the last Dorsal Vertebra, and the lower Border of the last Rib.
- Branches of the Lumbar Plexus and the last Dorsal Nerve.
- 62 From the bodies of the last Dorsal and first Lumbar Vertebrae, and Inter-vertebral substance (Fibro-cartilage), and is inserted by a broad Tendon into the Pectineal line of the Os Pubis.
- 63 The Diaphragm.
- 64 Into two portions, the greater and lesser Muscle of the Diaphragm.
- 65 At the circumference from the posterior part of the Xiphoid Cartilage, from the inner surfaces of the six lower Ribs, indigitating with the Transversalis, and from the two Aponeurotic or fibrous arches or bands, (Ligamentum Arcuatum Externum et Internum), from these origins the fibres converge and are inserted into the central Tendon of the Muscle.
- 66 The upper Border of the anterior fibrous band or Lamella of the Aponeurosis of the Transversalis Muscle, extending on either side over the Quadratus Lumborum and Psoas Muscles, from the extremity of the

- Transverse Process of the first or second Lumbar Vertebrae, to the apex and lower Border of the last Rib.
- 67 A fibrous Band or Arch crossing the Psoas Magnus Muscle, as it passes from the Pelvis, extending on either side from the Tendinous part of the Pillar of the Diaphragm, to the Transverse Process of the first or second Lumbar Vertebra.
- 68 By fleshy Bands or Fasciculi.
- 69 The central Aponeurosis of the Diaphragm, in form compared by Winslow to a trefoil leaf, the right division or process of which is the largest and the left the smallest.
- 70 The right division.
- 71 By two Tendinous processes from the bodies of the Lumbar Vertebrae.
- 72 This Process, which is the longest of the two, arises from the anterior surfaces of the bodies of the three first Lumbar Vertebrae and Inter-vertebral substance.
- 73 From the sides of the first two Lumbar Vertebrae.
- 74 They form two fleshy Bellies which ascend to their insertion in the central Tendon.
- 75 The Pillars or Crura.
- 76 The Oesophagus and Pneumogastric Nerves.
- 77 In front of the Aorta between this Vessel and the Oesophageal opening; the right is the most anterior.
- 78 The opening of the Aorta, between the Crura and Vertebral column.
- 79 By the Tendinous arch thrown from the Tendon of one Crus, to the other across the Vertebral Column.
- 80 The Aorta, Thoracic Duct, and sometimes the Vena Azygos.

PERINEAL REGION.

- 81 Into two groups, those connected with the Organs of Generation and Urethra, and those of the Anus.
- 82 Erector Penis, Accelerator Urinae, Transversalis Perinei, Compressor Urethrae, the two Sphincters Ani, and the Levator Ani.
- 83 Erector Clitoridis, Constrictor vel Sphincter Vaginae, Transversalis Perinei, Compressor vel Constrictor Urethrae, two Sphincters Ani, and Levator Ani.
- 84 From the internal surface of the Tuberosity of the Ischium and its Ramus, and is inserted into the fibrous Sheath of the Corpus Cavemosum.
- 85 From the common Tendon along the middle line, and

the Tendinous point in the centre of the Perineum, and is inserted by its posterior fibres with the Ramus of the Pubis, the anterior fibres into the fibrous Sheath of the Corpus Caverosum and Fascia of the Penis, and the middle or intervening fibres encircle the Canal of the Urethra (its spongy part), and meet on its upper surface where they unite with those of its fellow.

- 86 From the inner surface of the arch of the Pubes, near the Tuberosity of the Ischium, and is inserted into the central Tendinous point of the Perineum.
- 87 This Muscle consists of two portions, the fibres of one portion are transverse and the other perpendicular; the transverse portion arises by Tendinous fibres from the Sub-pubic arch, and divides into two Fasciculi or Layers, which encircle the Membranous portion of the Urethra, and are inserted into the middle line by Tendon, upon the upper & lower surfaces of the Urethra.
- 88 By two Tendinous points from the inner surface of the Pubic Arch close to the Symphysis, and is inserted into the upper Layer of the transverse portion.

MUSCLES OF THE ANUS.

- 89 Posteriorly by a fibrous Band from the Tip or apex of the Coccyx and the superficial Fascia around the same Bone, and is inserted in the superficial Fascia, and central Tendinous point of the Perineum.
- 90 This Muscle is nothing more than a circular Band of the involuntary fibres of the large intestine: the Rectum.
- 91 From the oblique line on the inner surface of the Pubes, the inner surface of the Spine of the Ischium, and between those two points of Bone from the angle formed by the union of the Obturator and Pelvic Fasciæ, and is inserted into the apex of the Coccyx and a fibrous Raphe, along the middle line into the lower part of the Rectum and base of the Bladder, (Recto-vesical Fascia).
- 92 Upper part of the Spine of the Ischium and inserted into the side of the Coccyx, and side and lower part of the Sacrum.
- 93 Into the Coccyx and Fibrous Raphe, extremity of the Rectum and Vagina.
- 94 Laterally into the Constrictor Vaginæ.
- 95 Into the Fascia of the Corpus Clitoridis, and is analogous to the Erector Penis in the Male.

- 96 This Muscle corresponds to the Accelerator vel Ejaculator Urinæ in the Male, and arises from the Tendinous centre of the Perineum, and is inserted into the Corpus Clitoridis.

SECTION XVII.—MUSCLES OF THE UPPER EXTREMITY.

- 1 Into those of the Shoulder, Arm, Forearm, and Hand.
- 2 Into anterior and lateral Thoracic, anterior and posterior Scapular, and the Acromial Region.
- 3 Pectoralis Major et Minor, Sub-clavius and Serratus Magnus.
- 4 This triangular-shaped Muscle arises superiorly from the Sternal half of the Clavicle, anterior surface of the Sternum from the Cartilages of the true Ribs, except the first and last, and inferiorly from the Aponeurosis of the Obliquus Externus Abdominis, from this extensive origin the Muscle crosses the Axilla, and is inserted by a broad Tendon into the outer margin of the Bicipital Groove of the Humerus.
- 5 This triangular-shaped Muscle arises by fleshy digitations from the front and upper Border of the third, fourth, and fifth Ribs, external to their Cartilages, and is inserted into the anterior half of the upper surface of the Coracoid Process of the Scapula, near its extremity.
- 6 Short Head of the Biceps and Coraco-Brachialis.
- 7 By a rounded Tendon from the union of the Osseous and Cartilaginous parts of the first Rib, (anterior to the Rhomboid Ligament), and is inserted into a depression at the under surface of the Clavicle.
- 8 From the outer surface and lower Border of the eight superior Ribs, by 9 fleshy Serrations owing to two Processes being attached to the second Rib, and is inserted into the rough surface along the whole length of the posterior Border of the Scapula.
- 9 With similar Serrations of origin (four and sometimes five), from the Obliquus Externus Abdominis.
- 10 The Sub-scapularis, Supra and Infra Spinatus, Teres Major et Minor, and the Deltoid.
- 11 From the whole concave or under surface of the Scapula, except the Neck and angles, and is inserted into the inner or lesser Tuberosity of the Humerus.
- 12 From the whole surface of the Supra-spinous Fossa,

- except the Cervical part, from the upper side of the Ridge or Spine of the Bone and Tendinous Fascia covering its surface, and is inserted into one of the three impressions (the upper), on the greater Tuberosity of the Humerus.
- 13 From the whole surface of the Infra-spinous Fossa (except the Neck, inferior Border and lower angle), also from the lower side of the Ridge or Spine of the Bone, and the Tendinous Fascia covering its surface, and is inserted into one of the three little impressions (the middle), on the greater Tuberosity of the Humerus.
 - 14 The Supra Spinatus and Teres Minor.
 - 15 From the rough and somewhat expanded surface on the Dorsum of the Scapula, also the lower third of its inferior Border, and the Tendinous Fascia covering the Teres Minor, and is inserted into the inner margin of the Bicipital Groove.
 - 16 From the outer surface of the Scapula, from the middle third of the Axillary or inferior Border of the same Bone and the Tendinous Fascia, and is inserted into one of the three impressions (the lower or inferior), on the greater Tuberosity of the Humerus.
 - 17 This triangular-shaped Muscle arises from the lower Border of the Spine of the Scapula, the lower Border of the Acromion Process, and external third of the Clavicle, and is inserted into a rough impression (the Deltoid Ridge), above the Border of the outer aspect of the Humerus.
 - 18 The Trapezius.
 - 19 The Pectoralis Major.
 - 20 Into the anterior and posterior Humeral Regions.
 - 21 The Biceps, Coraco-brachialis, and Brachialis Anticus.
 - 22 This Muscle arises by two Tendons, the short Head arises conjointly with the Coraco-brachialis, from the extremity or apex of the Coracoid Process, and the external or long Head from the upper margin of the Glenoid Cavity, and is inserted by a rounded Tendon into the inner part of the Tubercle of the Radius.
 - 23 From the extremity of the Coracoid Process, conjointly with the short Head of the Biceps, and is inserted into the rough Ridge about the middle of the inner Aspect of the Humerus.
 - 24 From the anterior surface of the Humerus, below the

- insertions of the Deltoid and Coraco-brachialis Muscles, and is inserted into the rough impression on the anterior part of the Coronoid Process of the Ulna.
- 25 **Triceps Extensor Cubiti.**
- 26 **This Muscle arises by three Heads; the long, middle, or Scapular Head arises from the inferior Border of the Scapula, near its Glenoid Cavity; the internal second, or short Head, extends from the inner Condyle along the inner margin of the Humerus, to the lower Border of the Tendon of insertion of the Teres Major, and the external or third Head extends from the outer Condyle along the external Border and posterior surface of the Humerus, to the Tendon of insertion of the Teres Minor, and is inserted into the Olecranon Process of the Ulna and Aponeurotic Tendon of the Forearm.**
- 27 **Pronator Radii Teres, Flexor Carpi Radialis, Palmaris Longus, Flexor Carpi Ulnaris, Flexor Digitorum Sublimis vel Perforatus, Flexor Digitorum Profundus vel Perforans, Flexor Longus Pollicis, and Pronator Quadratus.**
- 28 **By two distinct Heads, one from the internal Condyle of the Humerus, Fascia of the Forearm, and Inter-muscular Septum, the other or second Head from the inner part of the Coronoid Process of the Ulna, and is inserted into a rough surface on the outer and back part of the middle third of the Shaft of the Radius.**
- 29 **The Median Nerve.**
- 30 **From the internal Condyle of the Humerus, Fascia of the Forearm and Inter-muscular Septum, and its Tendon is inserted, after passing through the Groove in the Os Trapezium, into the base of the Metacarpal Bone of the Index Finger.**
- 31 **From the internal Condyle of the Humerus, Fascia of the Forearm and Inter-muscular Septum, and is inserted in the Palmar Fascia.**
- 32 **This Muscle arises by two Heads, one from the internal Condyle of the Humerus, and the other from the inner side of the Olecranon Process and upper two-thirds of the posterior Ridge of the Ulna, and is inserted into the Pisiform Bone and base of the Metacarpal Bone of the Little Finger.**
- 33 **The Ulnar Nerve and posterior Ulnar Recurrent Artery.**
- 34 **This Muscle arises by two Heads, one from the internal**

Condyle of the Humerus, Inter-muscular Septum, and internal lateral Ligament; the other or second Head from the inner part of the Coronoid Process of the Ulna, and from the oblique line leading from the Tubercle of the Radius towards the outer side of that Bone and a little below the middle of the Forearm, and divides into four Tendons which pass beneath the Annular Ligament, and are inserted in the base of the middle or second Phalanges of the Fingers, where they divide to give passage for the Tendons of the Flexor Digitorum Profundus.

- 35 The Median Nerve and Ulnar Artery.
- 36 From the upper two-thirds of the anterior and inner surfaces of the Ulna (as low as the Pronator Quadratus), and inner half of the Interosseous Membrane, from the depression on the inner part of the Olecranon and Aponeurosis common to this Muscle and the Flexor Carpi Ulnaris, and divides beneath the Annular Ligament into four Tendons, which are inserted into the bases of the last Phalanges of the Fingers.
- 37 From the upper two-thirds of the Grooved surface on the anterior part of the Radius, as low as the Pronator Quadratus, the outer part of the Interosseous Membrane, and by a small Fasciculus on either side of the Brachialis Anticus; and its Tendon, passing beneath the Annular Ligament, is inserted into the base of the last Phalanx of the Thumb.
- 38 From the lower fourth of the anterior and inner parts of the Ulna, commencing just below the Flexor Digitorum Profundus, and is inserted into the lower fourth of the anterior part of the Radius, commencing just below the Flexor Longus Pollicis.
- 39 Supinator Radii Longus, Extensor Carpi Radialis Longior et Brevior, Extensor Communis Digitorum, Extensor Minimi Digiti, Extensor Carpi Ulnaris, Anconeus, Supinator Brevis, Extensor Ossis Metacarpi Pollicis, Extensor Primi Internodii Pollicis, Extensor Secundi Internodii Pollicis, and Extensor Indicis.
- 40 From the external Condylloid Ridge, nearly one third of the Bone in extent, from the external Inter-muscular Septum, and is inserted into the lower extremity of the Radius, a little above its Styloid Process.
- 41 From the external Condylloid Ridge, just below the preceding Muscle, and Inter-muscular Septum, and after

- passing through a Groove in the lower end of the Radius, is inserted into the base of the Metacarpal Bone of the Index Finger.
- 42 From the external Condyle of the Humerus and the common Extensor Tendon, and after passing through the same Groove as the preceding Muscle, is inserted into the base of the Metacarpal Bone of the middle Finger.
- 43 From the external Condyle and common Tendon, and before it passes under the Annular Ligament divides into three Tendons, and after it has passed through the most internal Tendon divides into two; all of which are inserted into the bases of the second and third Phalanges of the Fingers.
- 44 This small Muscle placed between the last named Muscle and the Extensor Carpi Ulnaris, arises from the common Extensor Tendon, and is inserted into the base of the second and third Phalanx of the Little Finger.
- 45 The Auricularis, from the circumference of the Little Finger being introduced into the Meatus of the Ear, as a means of removing any foreign body which may have been accidentally admitted into it, &c.
- 46 From the external Condyle, from the common Tendon and upper two-thirds of the posterior Border of the Ulna by Aponeurosis, and passing through a special Sheath in the Annular Ligament, is inserted into the base of the Metacarpal Bone of the Little Finger.
- 47 This small triangular Muscle arises from the external Condyle, and is inserted into the outer part of the Olecranon Process of the Ulna, also the triangular surface at the upper third of the posterior surface of the same Bone.

DEEP LAYER.

- 48 From the Orbicular and external lateral Ligament, from the surface on the back part of the Ulna below its lesser Sigmoid Cavity, and is inserted into the upper third of the oblique line of the Radius, as far as the insertion of the Pronator Radii Teres Muscle.
- 49 From the posterior surface of the Radius immediately below the preceding Muscle, from a corresponding portion of the Ulna and from the Interosseous Membrane, and is inserted into the base of the first Metacarpal Bone.
- 50 From the Interosseous Membrane and Radius just below

the preceding Muscle, also a little from the Ulna, and is inserted into the base of the first Phalanx of the Thumb.

- 51 From the Interosseous Membrane and posterior surface of the Ulna, and passing through a separate Canal in the Annular Ligament, is inserted into the base of the last Phalanx of the Thumb.
- 52 From the Interosseous Membrane and the Ulna, internal to and just below the preceding Muscle, and is inserted with the common Extensor Tendon into the base of the second Phalanx of the Index Finger.

MUSCLES OF THE HAND.

- 53 Into those of the Thumb, Little Finger, and Palm; or external, internal, and Palmar.
- 54 Abductor Pollicis, Flexor Ossis Metacarpi vel Opponens Pollicis, Flexor Brevis Pollicis and Adductor Pollicis.
- 55 From the Os Scaphoides and Annular Ligament, and is inserted into the base of the first Phalanx of the Thumb.
- 56 From the Os Trapezium and Annular Ligament, and is inserted into the whole length of the anterior surface of the Metacarpal Bone.
- 57 This Muscle arises by two Heads, the outer or smaller Head from the Os Trapezium and Annular Ligament, and the inner Head from the Os Trapezoides, Os Magnum, & the bases of the second and third Metacarpal Bones, and is inserted into the sides and base of the first Phalanx of the Thumb.
- 58 From two-thirds of the anterior surface of the Metacarpal Bone of the Middle Finger, and is inserted into the inner side of the base of the first Phalanx of the Thumb.
- Palmaris Brevis, Abductor Minimi Digiti, Flexor Brevis Minimi Digiti, & Adductor vel Opponens Minimi Digiti.
- 59 From the Palmar Fascia and passing inwards is inserted into the Integument of the Hand; its inner side.
- 60 From the Pisiform Bone where its Fibres are blended with those of the Flexor Carpi Ulnaris, and is inserted conjointly with the Flexor Brevis Minimi Digiti into the base of the first Phalanx of the Little Finger.
- 61 From the Unciform Bone and Annular Ligament, and is inserted conjointly with the preceding Muscle.
- 62 From the Unciform Bone and Annular Ligament, and is inserted into the whole length of the Ulnar or inner side of the Metacarpal Bone of the Little Finger.

- 63 The Lumbricales and Interossei, (Palmar and Dorsal).
- 64 Four; and considered as accessories from the Tendons of the Flexor Digitorum Profundus. These small Muscles arise from the external or Radial side of the Flexor Tendons and pass towards the corresponding sides of the Fingers, where they are inserted in the Aponeurotic expansion on the Dorsal Aspect of the Fingers.
- 65 Three.
- 66 From the Aponeurotic expansion of the Metacarpal Bones on the Palmar surface, viz. : the Fore or Index Finger, the Ring Finger, and the Little Finger; and are inserted into the bases of the first Phalanges and Aponeurotic expansion of the Extensor Tendon of the same Fingers.
- 67 Four.
- 68 They arise by two Heads from the adjoining surfaces of the two Metacarpal Bones between which they are placed, and are inserted into the bases of the first Phalanges, and the Aponeurotic expansion on the Dorsal surface.
- 69 The Abductor Indicis.
- 70 From the greater part of the Metacarpal Bone of the Fore Finger and upper half of that of the Thumb, and is inserted into the base of the first Phalanx of the Index Finger, its Radial side.
- 71 The Radial Artery.

SECTION XVIII.—MUSCLES OF THE LOWER EXTREMITY.

- 1 Into those of the Hip, Thigh, Leg, and Foot.
- 2 Gluteus Maximus, Medius et Minimus, Piriformis, Gemellus Superior et Inferior, Obturator Internus et Externus, and Quadratus Femoris.
- 3 From the posterior fourth of the Crest of the Ilium, below with the posterior surface of the last piece of the Sacrum and side of the Coccyx, and from the posterior or great Sacro-ischiatic Ligament, and is inserted into the rough longitudinal line leading from the great Trochanter to the Linea Aspera; also with the Fascia Lata on the outer part of the Thigh.
- 4 From the outer Lip of the Crest of the Ilium, (four-fifths of its length), from the outer surface of that Bone between the Crest and superior curved line, except where the preceding Muscle arises behind and

from the Fascia Lata on its anterior part, and is inserted into the upper and outer surface of the great Trochanter.

- 5 A Bursa.
- 6 From the outer surface of the Dorsum Ilii, between the superior and inferior curved lines, and is inserted into the anterior part of the great Trochanter, conjointly with the preceding Muscle.
- 7 Arises by three fleshy and Tendinous Fasciculi, from the second, third, and fourth pieces of the Sacrum anteriorly, and passes out of the Pelvis through the great Sacro-ischiatic Notch, and is inserted into the upper Border of the great Trochanter, anterior to the Gluteus Medius.
- 8 The Gluteal Vessels and Nerve above, from the Sciatic and Pudic Vessels and Nerves which are below.
- 9 From the upper and posterior Spine of the Ischium and inserted conjointly with the Tendon of the Obturator Internus, into the superior Border of the great Trochanteric Fossa.
- 10 From the upper and posterior part of the Tuberosity of the Ischium, and is inserted conjointly with the Tendon of the Obturator Internus into the superior Border of the great Trochanteric Fossa.
- 11 From the inner surface of the Pelvis and around the Obturator Foramen, and passing out of the Pelvis through the lesser Sacro-ischiatic Notch is inserted conjointly with the Gemelli into the superior Border of the great Trochanteric Fossa anterior to the Piriformis.
- 12 From the anterior half of the outer surface of the Obturator Membrane, and from that surface of the Bone internal to the Obturator Foramen, and is inserted into the Pit or Digital Fossa at the Root of the great Trochanter.
- 13 From the outer Border of the Tuberosity of the Ischium and is inserted into the rough line (Linea Quadrati), on the upper and posterior Border of the Femur just above the insertion of the Adductor Magnus.
- 14 Into the anterior, internal, & posterior Femoral Regions.
- 15 The Sartorius, Tensor Vaginæ Femoris, Rectus, and Triceps Extensor, (vel Vastus Externus et Internus, and Crureus.)
- 16 The Sartorius.

- 17 From the anterior-superior Spine of the Ilium, and one-half of the Notch between this and the anterior-inferior Spine of the same Bone, and is inserted below the Knee into the inner surface of the Tibia, opposite the Tubercle just above the insertion of the Gracilis.
- 18 From the front of the Crest of the Ilium near to the anterior-superior Spine and part of the Notch below, as far as the origin of the preceding Muscle, and is inserted into the Fascia Lata, three or four inches below the great Trochanter.
- 19 This Muscle arises by two Heads or Tendons, one from the anterior-inferior Spine of the Ilium, and the other from the upper Lip of the Acetabulum, and is inserted into the Patella conjointly with the common Extensor Tendon.
- 20 From the anterior part and outer surface of the base of the great Trochanter, the outer surface of the Linea Aspera, extending downwards as far as the external Condyle, and from the external Inter-muscular Septum, and is inserted with the Rectus and Vastus Internus into the common Tendon.
- 21 From the anterior Inter-trochanteric line, extending downwards to near the articular surface of the Femur, externally to the Vastus Externus, and internally to the inner Border of the Linea Aspera, and the line running from it to the internal Condyle, and are inserted conjointly with the Vastus Externus into the common Tendon.
- 22 Iliacus Internus, Psoas Magnus, Pectineus, Adductor Longus, Brevis, and Magnus, and the Gracilis.
- 23 From the internal concave surface of the Ilium, and is inserted conjointly with the Tendon of the Psoas Magnus into the lesser Trochanter of the Femur.
- 24 From the front of the Transverse Processes and bodies of the Lumbar Vertebrae, the body of the last Dorsal Vertebra, and from a series of Tendinous Bands over the last Dorsal and four upper Lumbar Vertebrae and from the Inter-vertebral substances, and is inserted conjointly with the preceding Muscle into the lesser Trochanter of the Femur.
- 25 From the Ilio-pectineal line of the Os Pubis, and triangular smooth surface in front of this line, & is inserted into the upper part of the line which leads from the anterior Inter-trochanteric Ridge to the Linea Aspera.

- 26 From the front of the Pubes near its angle and is inserted into the middle third of the inner margin of the Linea Aspera of the Femur.
- 27 From the descending Ramus of the Pubes, and is inserted into the line leading from the Linea Aspera towards the lesser Trochanter, beneath the two preceding Muscles.
- 28 The Adductor Magnus.
- 29 From the Os Innominatum, commencing at the Sub-Pubic arch, extending from the lower Border of the Symphysis to the lower part of the Tuberosity of the Ischium, and is inserted into the whole length of the Linea Aspera, and the line leading from it to the inner Condyle.
- 30 The Femoral Vessels into the Popliteal space.
- 31 From the lower edge or margin of the Os Pubis, and is inserted a little below the inner Tuberosity of the Tibia, between the Sartorius & Semitendinosus Muscles.
- 32 Biceps, Semitendinosus, and Semimembranosus.
- 33 This Muscle arises by two Heads, the long Head from the posterior part of the Tuberosity of the Ischium by a common Tendon with the Semitendinosus, and the short Head from the lower two-thirds of the external Border of the Linea Aspera, as far as the outer Condyle and from the Inter-muscular Septum, and is inserted into the Head of the Fibula.
- 34 The Biceps Femoris.
- 35 The Semitendinosus, Semimembranosus, Gracilis, and Sartorius.
- 36 From the Tuberosity of the Ischium conjointly with the long Head of the Biceps, and is inserted into the inner surface of the Tibia, just below the insertion of the Gracilis.
- 37 A Bursa.
- 38 From the posterior part of the Tuberosity of the Ischium, and is inserted into the posterior and inner part of the Tuberosity of the Tibia.
- 39 Into an anterior and a posterior Tibial Region, and a Fibular Region.
- 40 Tibialis Anticus, Extensor Proprius Pollicis, Extensor Longus Digitorum, and the Peroncus Tertius.
- 41 From the outer Tuberosity and upper two-thirds of the Tibia, the Interosseous Membrane and deep Fascia, and is inserted into the under surface of the interna^l

- Cuneiform Bone, and the contiguous extremity of the first Metatarsal Bone (its base).
- 42 From the middle three-fourths of the anterior part of the inner surface of the Fibula and the Interosseous Membrane, and is inserted into the base of the last Phalanx of the great Toe.
 - 43 From the outer Tuberosity of the Tibia, the Head and upper three-fourths of the inner surface of the Fibula, and the Interosseous Membrane and deep Fascia, and is inserted, after dividing into four Tendons, into the second and third Phalanges of the four lesser Toes.
 - 44 From the anterior Border and inner surface of the lower fourth of the Fibula and Interosseous Membrane, and is inserted into the Tarsal extremity of the Metatarsal Bone of the Little Toe.
 - 45 The superficial Layers are the Gastrocnemius, Soleus and Plantaris; and the deep Layers are the Popliteus, Flexor Longus Pollicis, Flexor Longus Digitorum, and Tibialis Posticus.
 - 46 This Muscle arises by two Heads, the inner Head from the posterior surface of the inner Condyle of the Femur, just behind the Adductor Magnus, the outer Head from the external surface of the outer Condyle, just above the origin of the Popliteus, and is inserted conjointly with the Soleus into the common Tendon, the Tendo Achillis, into the lower part of the posterior Tuberosity of the Os Calcis.
 - 47 A Bursa.
 - 48 The two Heads of the Gastrocnemius.
 - 49 A Sesamoid Bone.
 - 50 From the Head and upper third of the posterior surface of the Fibula, from the oblique line and middle third of the Tibia, and is inserted conjointly with the preceding Muscle into the common Tendon.
 - 51 Tendo Achillis.
 - 52 About the middle of the back part of the Leg, and is inserted into the lower part of the posterior Tuberosity of the Os Calcis.
 - 53 The Plantaris.
 - 54 Between the two preceding Muscles, and arises from the outer Condyle of the Femur and posterior Ligament of the Knee-joint, and is inserted into the inner side of the posterior Tuberosity of the Os Calcis, by the side of the Tendo Achillis.

- 55 From a depression on the outer surface of the external Condyle of the Femur below the external lateral Ligament, and is inserted into the posterior surface of the Tibia, above the oblique line and just above the origin of the Soleus.
- 56 Below the Soleus from the lower two-thirds of the posterior surface of the Fibula, Inter-muscular Septum, and is inserted, after passing the Groove in the Astragalus and crossing the Sole of the Foot, into the base of the last Phalanx of the Great Toe.
- 57 From one half of the posterior surface of the Tibia, *i.e.* from the oblique line to within three or four inches of the lower end of the Bone, and is inserted, after dividing into four Tendons, into the base of the last Phalanx of the four lesser Toes.
- 58 From the adjacent sides of the Tibia and Fibula, for about three-fifths of the Bones also the Interosseous Membrane, and is inserted into the inner surfaces of the Scaphoid and internal Cuneiform Bones, and some of the Fibres are occasionally prolonged to the second and third Metatarsal Bones.
- 59 The Interosseous Membrane.
- 60 The Peroneus Longus et Brevis.
What is the origin and insertion of the Peroneus Longus?
From the Head and upper two-thirds of the outer surface of the Fibula, and is inserted (after passing behind the outer Malleolus and through a Groove in the outer border of the Os Cuboides), into the base of the Metatarsal Bone of the Great Toe, and by a few Fibres into the internal Cuneiform Bone.
- 61 From the middle two-thirds of the outer surface of the Fibula and Inter-muscular Septum, and is inserted into the base of the Metatarsal Bone of the Little Toe.
- 62 Into a Dorsal and Plantar Region.
- 63 The Extensor Brevis Digitorum, and four Interossei Dorsales.
- 64 From the outer surface of the Os Calcis (near its articulation with the Os Cuboides), and is inserted, after dividing into four Tendons, into the base of the first Phalanx of the Great Toe, and the others into the sides of the long Extensor Tendon of the second, third, and fourth Toes.
- 65 They arise each by two Heads from the lateral surfaces of the two Metatarsal Bones, between which they are

- placed, and are inserted into the inner and outer sides of the bases of the second, third, and fourth Phalanges of the first row, and into the Aponeurotic expansion of the long Extensor Tendons.
- 66 Into four Layers.
- 67 The Abductor Pollicis, Flexor Brevis Digitorum vel Flexor Perforatus, and the Abductor Minimi Digiti.
- 68 This Muscle arises by two Heads, one from the internal Tubercle on the under surface of the Os Calcis, and the other from the internal Annular Ligament and Plantar Fascia, and is inserted into the inner side of the base of the first Phalanx of the Great Toe.
- 69 From the inner Tubercle on the under surface of the Os Calcis and the Plantar Fascia, and is inserted, after dividing into four Tendons, into the base of the second Phalanx of the four outer Toes.
- 70 From the external and internal Tuberosities of the Os Calcis, the Plantar Fascia and Inter-muscular Septum, and is inserted into the outer side of the base of the first Phalanx of the Little Toe.
- 71 The Lumbricales and Musculus vel Flexor Accessorius.
- 72 Four.
- 73 From the Tibial side of the common Tendons of the Flexor Longus Digitorum, and are inserted into the base of the first Phalanx of the four outer Toes, also into the Aponeurotic expansion of the common Extensor Tendon.
- 74 This Muscle arises by two Heads, the outer or Tendinous slip from the outer and under surface of the Os Calcis the inner or fleshy slip from the inner and under surface of the Os Calcis, and is inserted into the common Tendon of the Flexor Longus Digitorum.
- 75 The long Plantar Ligament.
- 76 The Flexor Brevis Pollicis, Adductor Pollicis, Transversalis Pedis, and Flexor Brevis Minimi Digiti.
- 77 From the inner Border of the Cuboid Bone, and the second and third Cuneiform Bones, and is inserted by two Heads one on each side of the base of the first Phalanx of the Great Toe.
- 78 Two Sesamoid Bones.
- 79 From the Tendinous Sheath of the Peroneus Longus Muscle, the Cuboid Bone, and the bases of the third and fourth Metatarsal Bones, and is inserted into the base of the first Phalanx of the Great Toe.

- 80 This Muscle arises by fleshy slips from the Heads of the Metatarsal Bones of the four outer Toes, and is inserted conjointly with the Adductor Pollicis into the base of the first Phalanx of the Great Toe.
- 81 From the base of the Metatarsal Bone of the Little Toe and the Tendinous Sheath of the Peroneus Longus Muscle, and is inserted into the base of the first Phalanx of the Little Toe.
- 82 The Interossei Plantares et Dorsales,
- 83 These Muscles arise from the inner and under surfaces of the three outer Metatarsal Bones, and are inserted into the bases of the Metatarsal Phalanges of the same Toes (viz. the three outer), and into the Aponeurotic expansion of the common Extensor Tendon.
- 84 They arise from the adjacent sides of the two Bones between which they are placed, and are inserted as follow: the two inner are inserted one on either side the base of the second Metatarsal Phalanx, the third to the external side of the base of the third Metatarsal Phalanx, and the fourth to the external side of the base of the fourth Metatarsal Phalanx.

SECTION XIX.—FASCIÆ.

- 1 Fasciæ are Membranous investments distributed through the various Regions of the body for the purpose of investing or protecting the Muscles and more delicate parts.
- 2 Into three classes; Cellular Fasciæ, Cellulo-fibrous Fasciæ, and Tendino-fibrous Fasciæ.
- 3 The superficial Fascia is a Cellular investment which exists throughout the Body, immediately beneath the Skin and forms the connecting medium between it and the deeper parts of the body.
- 4 Similar to Cellular Fasciæ, with the exception that it is free from Adipose Tissue in its structure.
- 5 Fasciæ of the Neck, Thoracic Fasciæ, also the Sheaths of Vessels.
- 6 The strongest, the most inelastic and unyielding of the three kinds of investing Membrane.
- 7 The Fasciæ of the Pelvis, Knee, Elbow, Wrist, &c.
- 8 Like the Muscles; into those of the Head and Neck, the Trunk, the upper extremity and the lower extremity.
- 9 The Temporal Fasciæ, Superficial & deep Cervical Fasciæ.

- 10 The Temporal Fascia is that strong, white, Tendino-fibrous Membrane which gives attachment to the Temporal Muscle, from the curved line or Temporal Ridge above to the Zygomatic arch below.
- 11 Two; between which may be observed the Cutaneous Vessels and Nerves, *e.g.* the superficial Epigastric Artery and Vein, the Radial & Ulnar Veins, Saphenous Veins; Cutaneous Muscles, as the Platysma Myoides, Orbicularis Palpebrarum, &c.
- 12 Processes of the Membrane, which are prolonged inwards between the Muscles. In this locality it embraces the Sterno-Mastoid Muscle, also the Omo-hyoid.
- 13 The Thoracic Fascia is a Cellulo-fibrous Membrane, which consists of two parts, an external or Sub-cutaneous Layer and an internal or deep Layer; the former is analogous to that in other parts of the Body, and the internal or deeper one closely invests the Muscles. It is attached to the concave margin of the first Rib and inner aspect of the Sternum, where the large Vessels and Trachea pass through the Thoracic Fascia; it divides into two Layers, an ascending and descending Layer, the former is attached to the Trachea, and is continuous with the Sheath of the Carotid Vessels and deep Cervical Fascia, and the latter descends upon the Trachea to its Bifurcation, and continuous with the Fibrous Layer of the Pericardium.
- 14 The Fascia Transversalis, the Fascia of the Iliacus and Psoas, and the Fascia of the Pelvis.
- 15 A Cellulo-fibrous Layer which lines the inner surface of the Transversalis Muscle, it is thick and dense in the Inguinal Region, and becomes thinner as it ascends to the Thorax.
- 16 The internal Abdominal Ring.
- 17 About midway between the Symphysis Pubis and the anterior-superior Spine of the Ilium, and half an inch above Poupart's Ligament.
- 18 Integument, superficial Fascia, Inter-columnar Fascia, Cremaster Muscle, Transversalis Fascia, and Peritoneal Sac.
- 19 Integument, superficial Fascia, Inter-columnar Fascia, conjoined Tendon (of internal oblique and Transversalis Muscles), Transversalis Fascia, and Peritoneal Sac.
- 20 A Tendino-fibrous Layer which covers the two Mus-

cles, and like the Fascia-transversalis is thick and dense below and becomes thinner as it ascends.

- 21 From the inner surface of the Pubic Bone, and along the margin of the Brim of the Pelvis, where it becomes continuous with the Fascia of the Iliacus and Psoas Muscles, it descends into the Pelvis and divides into two Lamellæ, the Pelvic and Obturator Fascia.
- 22 The anterior Vesical Ligaments.
- 23 That portion of the Fascia which has received its name from its situation, and the same with the Recto-Vesical Fascia, and the other Membranous linings of the Abdominal and Pelvic Parietes already referred to.

PERINEAL FASCLE.

- 24 A thin Tendino-fibrous Membrane which covers in the Muscles of the Genital portion of the Perineum, and Root of the Penis.
- 25 The thin firm Fibro-cellular Membrane which fills up the space between the Rami of the Ossa Pubis and Ischii of a triangular form, with its base below and apex above, inferiorly it divides into two Layers, one continued forwards with the superficial Perineal Fascia, and the other prolonged backwards to the Rectum, and uniting with the Fascia of the Anus.
- 26 The Membranous portion of the Urethra, Cowper's Glands, Compressor Urethrae Muscle, internal Pudic Arteries, Nerves, and a Plexus of Veins.

FASCLE OF THE UPPER EXTREMITY.

- 27 The superficial Nerves, Veins and Lymphatics.
- 28 Thin over the Pectoralis Major and Deltoid Muscles, and in the Axillary Space, but dense and thick on the Dorsum Scapulæ.
- 29 The Clavicle, Acromion Process and Spine of the Scapula above, and below to the Olecranon Process, the Ulna, and in front of the Wrist is continuous with the anterior Annular Ligament and posterior aspect of the Wrist, it forms the posterior Annular Ligament, the Dorsal aspect of the Hand is invested with this Fascia which is continuous with the posterior Annular Ligament.
- 30 Three parts, a middle and two lateral portions, which latter are continuous with the Dorsal Fascia, whilst the middle portion is attached to the internal Annular Ligament, and divides into several Slips or Processes

which are inserted into the sides of the bases of the Phalanges of the fingers.

FASCIAE OF THE LOWER EXTREMITY.

- 31 The superficial Nerves, Veins, and Lymphatics.
- 32 Fascia Lata, which surrounds the Thigh and sends processes or Septa between the Muscles.
- 33 To the prominent borders of the Pelvis externally, the Crest of the Ilium, the lower extremity of the Sacrum and Coccyx, Tuberosity of the Ischium, Rami of the Ischium and Pubes and body of the Pubis, and with Poupart's Ligament; and is inserted in the Linea Aspera of the Femur and prominent parts around the Knee Joint.
- 34 The Tensor Vaginæ Femoris, and the Gluteus Maximus.
- 35 The Saphenous Opening for the transmission of the large Saphenous Vein and other Vessels.
- 36 The Iliac portion of the Fascia Lata from its attachment to the Iliac Crest.
- 37 The Pubic portion of the Fascia Lata from its attachment to the Pubes.
- 38 The Cribriform Fascia for the transmission of Lymphatic Vessels.
- 39 Integument, superficial Fascia, Cribriform Fascia, Fascia Propria, Septum Crurale, and Peritoneal Sac.
- 40 By its inner surface to the upper part of the Tibialis Anticus and Extensor Longus Digitorum Muscles.
- 41 The anterior Annular Ligament.
- 42 The external Annular Ligament.
- 43 The internal Annular Ligament.
- 44 From the lower border of the anterior Annular Ligament, and continuous on either side with the lateral portions of the Plantar Fascia.
- 45 Two Layers—superficial and deep—the former is continuous with the posterior Fascia of the Thigh and is thicker on the outer side of the Leg, by an expansion derived from the Biceps Tendon and terminates in the external and internal Annular Ligaments; the deep Layer forms the Inter-muscular Septa or Fascia between the superficial and deep Muscles.
- 46 Three: a middle and two lateral portions.
- 47 The central portion.
- 48 Posteriorly to the inner Tuberosity of the Os Calcis, and divides opposite the heads of the Metatarsal Bones into five Processes or Fasciculi, each of which divides

into two Slips which are inserted on either side the bases of the first Phalanges of the Toes.

- 49 They are continuous with the internal and external Annular Ligaments; on the external side with the Dorsal Fascia, and on the inner side with the central portion.

SECTION XX.—SPLANCHNOLOGY.

- 1 The doctrine or structure of the Viscera.
- 2 In the great cavities of the body.
- 3 Cranium, Thorax, and Abdomen.

THORACIC VISCERA.

- 4 Conical, with the apex above and base below and situated at the upper part of the Trunk of the body.
- 5 Anteriorly by the Sternum, superior Costal Cartilages, Ribs, and Inter-costal Muscles; posteriorly by the Vertebral Column, Ribs, and Inter-costal Muscles; laterally by the Ribs and Inter-costal Muscles; above by the Thoracic Fascia and the first Ribs, and, below, by the Diaphragm.
- 6 The Heart, with its Pericardium and great Vessels, the Lungs and their Pleuræ or Serous Coverings, the Œsophagus, and in the Fœtus, the Thymus Gland.

HEART.

- 7 The hollow Muscular Organ which receives the Blood from, and transmits it to, all parts of the body.
- 8 Obliquely in the Chest, beneath the lower two-thirds of the Sternum, its base is directed backwards to the right side, and its apex forwards to the left side.
- 9 By Septa into four cavities or compartments, viz.: two Auricles and two Ventricles.
- 10 The right Auricle communicates with the right Ventricle, and the left Auricle with the left Ventricle.
- 11 To receive the Blood from the large Venous Trunks and transmit it to the Ventricles.
- 12 Each has a large Artery into which the Blood is propelled, as will be afterwards described.

RIGHT AURICLE.

- 13 The right.
- 14 Into two parts, one named the Sinus, and the other Appendix Auriculæ.
- 15 Five: the superior and inferior Cava, the Coronary Vein, the Foramina Thebesii, and that of the Ventricle.
- 16 In the front and upper part of the Auricle.
- 17 At the lowest part of the Auricle near its Septum.

- 18 Into the Auricle between the inferior Cava and the opening of the Ventricle.
 - 19 To return the Venous Blood from the Heart's substance.
 - 20 Minate Apertures leading from the Muscular structure of the Heart into the Auricles and Ventricles.
 - 21 The opening of communication between the Auricle and Ventricle.
 - 22 The Eustachian and Coronary Valves.
 - 23 A Fold of the inner or Lining Membrane of this Cavity which is situated in front of the opening of the inferior Cava.
 - 24 The Fœtal period, as in the adult it forms only a vestige or remnant of structure.
 - 25 To direct the Blood of the Placenta from the inferior Cava into the left Auricle through the Foramen Ovale.
 - 26 A thin semi-lunar Fold of Lining Membrane over the entrance of the Coronary Vein into the Auricle, and sometimes called the Valve of Thebesius.
 - 27 To prevent the regurgitation of the Blood into the Coronary Vein during the contraction of the Auricle.
 - 28 A band of Muscular Fibres situated on the Septum of of the Auricles opposite the termination of the inferior Cava.
 - 29 Like the Annulus Ovalis a relict of Fœtal structure on the posterior Wall of the right Auricle, it is an oval depression corresponding to the remains of an opening in the Fœtus (the Foramen Ovale.)
 - 30 No such structure exists in it.
 - 31 A small elevation or projection of the Auricle which exists between the superior and inferior Cavæ.
 - 32 Small fleshy bands which run in various directions, and situated in the Appendix Auriculæ in the anterior Wall of the right Auricle.
- RIGHT VENTRICLE.
- 33 Triangular, with its base directed upwards towards the right Auricle.
 - 34 The anterior is convex, and the inferior, which is flat, rests on the Diaphragm.
 - 35 The Right.
 - 36 The Auriculo-ventricular opening.
 - 37 Opposite the centre of the Sternum, between the third Costal Cartilages.
 - 38 Three Folds of Lining Membrane connected by their circumference to the Auriculo-ventricular Opening,

- and by their sides they give attachment to small Tendinous Cords called *Chordæ Tendinæ*.
- 39 The Tendons of the thick Muscular Bands or Fibres called *Carneæ Columnæ*.
- 40 The Muscular or fleshy bands which cover the greater part of the internal surface of the right Ventricle except near the opening of the Pulmonary Artery, where the surface becomes smooth.
- 41 Into three sets: one set attached on one side only forming convexities in the cavity; a second set attached by both extremities, leaving the middle free, called *Tra-beculæ Carneæ*, and the third set form rounded bundles (*Columnæ vel Musculi Papillares*) which are attached by one extremity to the Walls of the Heart, and by the other, or free ends, to the slender Tendinous Cords—*Chordæ Tendinæ*.
- 42 The mouth or opening of the Pulmonary Artery.
- 43 To the left of the base, and above the Auriculo-ventricular opening.
- 44 The *Infundibulum vel Conus Arteriosus*, which is funnel-shaped.
- 45 By the Semi-lunar Valves.
- 46 Three; and formed by a Fold of the Lining Membrane, which is strengthened by a Layer of Fibrous Tissue.
- 47 They are attached by their convex borders, whilst their concave borders are free and directed upwards.
- 48 A small Fibro-cartilaginous Papilla or Tubercle called *Corpus Arantii*.
- 49 To support the flow or column of Blood in the Artery, and prevent its regurgitation into the Ventricle.

LEFT AURICLE.

- 50 At the upper & posterior part of the left side of the Heart.
- 51 Those of the four Pulmonary Veins and the Auriculo-ventricular opening.
- 52 Two from each Lung enter from opposite sides of the left Auricle.
- 53 No.
- 54 In the Appendix Auriculæ.
- 55 Yes.

LEFT VENTRICLE.

- 56 At the posterior and left side, and forms the apex of the Heart.
- 57 About seven lines, whilst those of its fellow (the right Ventricle) are only two-and-a-half lines in thickness.
- 58 The Auriculo-ventricular and the Aortic Opening.

- 59 The right.
- 60 To the left side of the Aortic Opening.
- 61 By a Membranous Fold around the Orifice, which consists of two Segments or Processes called the Mitral Valve.
- 62 The Aorta.
- 63 The three Semi-lunar or Sigmoid Valves.
- 64 Similar to those of the Pulmonary Artery, viz. to prevent or arrest the reflux of the circulating fluid into the Ventricle.
- 65 Yes.
- 66 Strata of Muscular Fibres and Fibrous Rings.
- 67 Bands of Fibres, which are chiefly disposed in a spiral or circular direction.
- 68 Chiefly transverse.
- 69 In Layers, which run in a spiral direction.
- 70 In rings around the Arterial and Auriculo-ventricular Orifices, and also sends prolongations into the Valves which belong to these openings.
- 71 The Endocardium, which is continuous with the Linings of the Veins and Arteries.

ARTERIES, VEINS, AND NERVES OF THE HEART.

- 72 The Coronary Arteries.
- 73 Two, right and left: they are the first Branches of the Aorta, and arise just above the Semi-lunar Valves.
- 74 The right or posterior Artery appears on the right side of the Pulmonary Artery, and runs in the Furrow between the right Auricle and Ventricle to the posterior aspect of the Heart, where it inosculates with its fellow (the left Coronary), in this course Branches are given off to the right side of the Heart.
- 75 The left or anterior Coronary Artery passes between the Pulmonary Artery and the left Appendix Auriculæ, in its course two or three Branches are given off to the substance of the Auricle and Ventricle, one, in particular, passes in the Auriculo-ventricular Groove towards the apex, and inosculates with the descending Branch of the right Coronary: it supplies the left side.
- 76 Three: the Great Cardiac or Coronary Vein, the posterior Cardiac Veins, and the anterior Cardiac Veins.
- 77 In the substance of the Ventricles near the apex of the Heart, and passing in the Groove at the back of the Heart, between the Auricles and Ventricles, terminates in the Coronary Sinus (in the right Auricle).

- 78 Near the apex of the Heart, and terminate in the Great Cardiac Vein in the right Auricle.
- 79 In the great Cardiac Vein.
- 80 A numerous set of minute Vessels in the substance of the Heart, which convey the Venous Blood into its four Cavities.
- 81 From the Cardiac Plexus above the right Pulmonary Artery, and behind the Aortic Arch.
- 82 By the union or convergence of the middle and inferior Cardiac Nerves, and by Branches from the Par-vagus.

PERICARDIUM.

- 83 The Fibro-serous Membrane which encloses the Heart. Somewhat conical, and situated in the middle of the Thorax in the interval between the Pleuræ.
- 84 Two Layers: an external or Fibrous one and an internal or Serous one.
- 85 Above, to the large Vessels at the Root of the Heart where it becomes continuous with the Thoracic Fascia; and below, to the central Tendon of the Diaphragm.
- 86 This Layer forms a shut Sac, thus the inner surface invests the Heart and commencement of the large Vessels, whilst the other is reflected on the inner surface of the Fibrous Layer.
- 87 By being lubricated with a Serous Fluid (Liquor Pericardii.)
- 88 From the Œsophageal, Bronchial, internal Mammary, and Phrenic Arteries.

CIRCULATION OF THE BLOOD.

- 89 By the alternate contraction of the Auricles and Ventricles: the Diastole and Systole of the Heart.
- 90 The dilatation of the Ventricles, occasioned by the contraction of the Auricles on their contents.
- 91 The contraction of the Ventricles, by which the Blood they contain is propelled through the Arteries.
- 92 The Heart, as previously described, consists of two Auricles and two Ventricles, which, from their position, are respectively named right and left: the right is the Venous side of the Heart, the Venous Blood from every part of the body is received by the superior and inferior Vena Cava and Coronary Vein into the right Auricle, which contracts and discharges its contents into the right Ventricle, which, when filled, contracts and discharges its contents through the Pulmonary Artery and its ramifications into the Lungs;

the Blood, having undergone the necessary changes, is returned as Arterial Blood by the four Pulmonary Veins into the left Auricle, which being distended, now contracts and propels its contents into the left Ventricle, and from the left Ventricle it is propelled through the Aorta into the Capillaries, where it is distributed to every part of the body, and again returned to the Heart by the Veins into the right Auricle where it undergoes the same process again.

- 93 The Tricuspid Valve.
- 94 The Mitral Valve.
- 95 Each by the Semi-lunar Valves.

TRACHEA.

- 96 The Air Tube extends from the Larynx to the Lungs, it commences opposite the fifth Cervical Vertebra and ends opposite the third, and sometimes as low as the fifth, Dorsal Vertebra, where it divides into the two Bronchi—one for each Lung.
- 97 About four-and-a-half inches long, and tubular, but flattened posteriorly, owing to the non-existence of Cartilaginous Bands.
- 98 Anteriorly of a series of Fibro-cartilaginous Segments or Rings (from sixteen to twenty in number), which extend for about two-thirds around the tube, and united by a yellow elastic Fibrous Tissue; the posterior part of the Tube is completed by Fibrous Membrane, Muscular Fibres, and Tracheal Glands.
- 99 By a Mucous Membrane with the subjacent yellow elastic Fibrous Tissue.
- 100 The divisions of the Trachea.

LUNGS.

- 101 In the Cavity of the Thorax on either side the Vertebral Column, and somewhat of a conical form.
- 102 At the lower border of the left Lung.
- 103 Into a base, an apex, two borders, two surfaces, and two lobes.
- 104 Broad and concave, and rests on the convex surface of the Diaphragm.
- 105 Form of a cone, and projects about an inch above the level of the first Rib.
- 106 Sharp and thin, and partly overlaps the Pericardium.
- 107 Thick and rounded, and corresponds to the hollow by the side of the Vertebral Column.
- 108 Convex, and in contact with the Wall of the Thorax.

- 109 Partially concave, to receive the convex surface of the Heart.
- 110 Incompletely into two Lobes by a long and oblique Fissure, which extends from the posterior part near the apex to the anterior border near the base.
- 111 Its upper Lobe is sub-divided by a second Fissure, which marks off a small triangular piece called the third Lobe of the same Lung; the right Lung is also larger and heavier than the left.
- 112 The left.
- 113 By their Roots, which consist of the Pulmonary and Bronchial Vessels, the Bronchial Tubes, and Plexuses of Nerves.
- 114 Midway between the base and apex.
- 115 Of a spongy texture, consisting of an immense number of minute Cells, in which the ultimate ramifications of the Air Tube terminate.
- 116 No; each is distinct, being provided with its own Air Tube, Vessels, and Nerves.
- 117 The Pleuræ.
- 118 Two: one for each Lung.
- 119 The Pleura Costalis.
- 120 The Pleura Pulmonalis.
- 121 The Mediastinum.
- 122 The Heart.
- 123 No; it is only one Septum which extends from the Sternum to the Spine.
- 124 The divisions of the Air Tube or Trachea.
- 125 In structure similar to the Trachea.
- 126 The left, which is about two inches long.
- 127 Obliquely downwards and outwards beneath the Aortic Arch, entering the left Lung at about the middle of its root, where it first divides into two Branches, one for each Lobe, they then divide and sub-divide into their ultimate terminations, forming the minute Bronchial Cells.
- 128 About one inch in length, passing forwards and outwards above the Arch of the right Pulmonary Artery, and entering the right Lung opposite the fourth Dorsal Vertebra.
- 129 From before backwards; the most anterior are the Pulmonary Veins; the most posterior, the Bronchus, and between the two is the Pulmonary Artery.

- 180 The Bronchus is the most superior, the Veins the most inferior, and between the two is the Artery.
- 181 The only two Vessels which change places are the Bronchus and Artery; the Artery is the most superior.
- 182 From the circumstance of the left Bronchus being at a lower level than the right Bronchus.
- 183 By the collection of the minute Cells into bundles or groups called Lobuli.
- 184 By the aggregation of the Lobuli.
- 185 By a Serous Layer, derived from the Pleura, which is continued over the surface, and by a Sub-serous Layer which dips into its interior, which subdivides it into pieces; the latter Layer contains Fibres of elastic Tissue, and divides the small masses into Lobules.
- 186 Of a Polyhedrous form, and about the one hundred-and-fiftieth of an inch across.

ARTERIES, VEINS, AND NERVES OF THE LUNGS.

- 187 Pulmonary and Bronchial Vessels.
- 188 Two.
- 189 In the left Auricle.
- 190 The right.
- 191 From the right ventricle.
- 192 Three; one for each Lobe of the right Lung.
- 193 Two; one for each Lobe of the left Lung.
- 194 From the anterior part of the Aorta.
- 195 The right one into the Vena Azygos Major, and the left into the superior Intercostal Vein.
- 196 From the Par-vagus and Sympathetic; forming the anterior and posterior Pulmonary Plexuses, whose Branches are distributed to the Bronchial Cells.
- 197 Chiefly at the bifurcation of the Trachea, and along the side of that Tube.
- 198 They are Lymphatic Glands connected with the Absorbent Vessels of the Lungs.

RESPIRATION.

- 149 The inhaling and exhaling the atmospherical air to and from the Lungs; in other words, Inspiration and Expiration.
- 150 In a state of relaxation the Diaphragm is arched, and by contracting it descends and the Ribs are raised, thereby increasing the capacity of the Chest, which occasions the air to pass down the Trachea, and thus fills the Bronchial Cells.
- 151 The Diaphragm.

- 152 Principally by the Intercostal Muscles, assisted by the Levatores Costarum, the Scaleni, Serratus Posticus Superior, and Thoracic Muscles generally.
- 153 By the relaxation and consequent ascent of the Diaphragm, and descent of the Ribs, which diminish the capacity of the Chest; the air is then expelled from the Lungs.
- 154 The Abdominal Muscles.
- 155 The Obliqui, Transversi and Recti Abdominis, Quadratus Lumborum, Serratus Posticus Inferior, Longissimus Dorsi, and Sacro-lumbalis.

SECTION XXI.—ŒSOPHAGUS.

- 1 This Muscular Canal extends from the Pharynx to the Stomach, it commences opposite to the fifth Cervical Vertebra, and terminates at the Cardiac Orifice of the Stomach opposite to the tenth Dorsal Vertebra.
- 2 About nine inches long, and its greatest diameter near its termination at the Cardiac Orifice.
- 3 It is composed of a Muscular Fibrous and Mucous Coat.
- 4 Two; an external and an internal one.
- 5 Longitudinally.
- 6 Circularly.
- 7 Between the Muscular and Mucous Coats.
- 8 Of a Reddish Colour above, and pale below.
- 9 It is thrown into longitudinal Folds, which disappear when the Canal is distended.
- 10 A Layer of Epithelium.
- 11 Œsophageal Glands.

SECTION XXII.—THYMUS GLAND.

- 1 Of an oblong form, and situated in the anterior Mediastinum, between the fourth Rib and Thyroid Gland.
- 2 It is a conglomerate Gland, consisting of Lobules which are arranged in a spiral form around a central Cavity, and connected together by Cellular Tissue.
- 3 No.
- 4 About the third month.
- 5 From six to eight drachms.
- 6 About the period of puberty.
- 7 No, but consists of two lateral parts connected with each other by Cellular Tissue.
- 8 A Vascular Mucous Membrane.
- 9 The Secretory Cell.
- 10 A Pouch.

- 11 A milky-like Fluid.
- 12 The Thoracic portion receives its Arteries from the internal Mammary Artery, and the Cervical portion from the superior and inferior Thyroid Arteries.
- 13 Chiefly in the left Vena Innominata.
- 14 Chiefly from the internal Mammary Plexus.
- 15 Yes, as proved by the late Sir Astley Cooper, who once succeeded in injecting them in the human subject.

SECTION XXIII.—MAMMÆ.

- 1 Two Glandular Bodies destined to secrete the Milk for the purpose of nourishing the offspring.
- 2 At the anterior, superior, and lateral parts of the Chest.
- 3 Each consists of the Papilla or Nipple, the Areola, and the Glandular or Secretory substance.
- 4 A little to the inner side of the centre of each Mamma is a conical projection of the Integument called the Nipple.
- 5 The Areola, the colour of which is influenced by the complexion of the body, also during pregnancy and lactation.
- 6 Several minute Orifices, which lead into the Sebaceous Follicles.
- 7 To secrete a fatty substance, which serves to protect the Nipple and Areola from irritation.
- 8 This conglomerate Gland consists of a series of minute Cæcal Vesicles which form the Lobules and Lobes of the Gland, the whole of which are united together by dense firm Areolar Tissue.
- 9 The ultimate terminations of the Excretory Ducts (Tubuli Lactiferi) from fifteen to twenty in number, which finally converge to the Nipple, where they terminate by open mouths or small Apertures, whose sizes vary from that of a common bristle to that of a common pin.
- 10 From eighteen to twenty.
- 11 It is composed of an external Cellular, or Fibrous Coat, and an internal or Mucous Lining.
- 12 They are capable of erection from the circumstance of being surrounded by an elastic fibrous structure, analogous to the Dartoid Tissue of the Scrotum.
- 13 From the Axillary Artery (its long Thoracic or external Mammary Branch), and from the anterior Inter-costal and some of the Perforating Branches of the internal

Mammary, which latter is derived from the Subclavian Artery.

- 14 Some form a Plexus, which terminates in the Axillary and internal Mammary Veins; others open into some of the Inter-costal Veins; others, again, into the Cervical Veins.
- 15 Those from the inner side of the Gland open into the Mediastinal Glands, whilst those from the outer side open into the Axillary Glands.
- 16 From the anterior and lateral Cutaneous Nerves of the Thorax, viz.: the third, fourth and fifth Inter-costal Nerves, which are the anterior primary Branches of the Dorsal Nerves, as elsewhere described.

SECTION XXIV.—ABDOMINAL VISCERA.

- 1 This Cavity is the largest in the body, of an oval form, and situated between the Thorax and Pelvis.
- 2 Above, by the Diaphragm; below, by the Pelvis, or rather, the Levatores Ani and the parts which close the outlet of the Pelvis; anteriorly and laterally by Osseous and Muscular Structures, viz.: the lower Ribs and Abdominal Muscles; and behind, by the Vertebral Column and the adjacent Muscles, viz.: the Quadrati Lumborum and Iliaci.
- 3 Arbitrarily into two portions, viz: the Abdomen Proper and Pelvic portion.
- 4 This portion, which extends from the Diaphragm to the brim of the Pelvis, contains the Digestive and Secretory Organs.
- 5 Chiefly the Generative and Urinary Organs.
- 6 Into three primary regions—a superior or Epigastric, a middle or Umbilical, and an inferior or Hypogastric Region.
- 7 Yes, each is subdivided into three minor Regions, *i.e.* each primary Region is divided into a central and two lateral ones.
- 8 The central one is the Epigastric, and the two lateral ones under the Cartilages of the Ribs are called the Hypochondriac Regions.
- 9 The central one is the Umbilical, and the two lateral the Lumbar Regions.
- 10 The central one is the Hypogastric vel Pubic Region, and the two lateral ones the Iliac or Inguinal Regions.
- 11 All that portion above a transverse line which extends

- from the most prominent point of the Cartilages of the Ribs on one side to the corresponding point on the opposite side, and, continuing the same line round the body, forms a circular line also.
- 12 The middle portion of the Stomach with its Pyloric Extremity the left Lobe and Lobulus Spigelii of the of the Liver, the Hepatic Vessels, Pancreas, Cæliac Axis, Semilunar Ganglia, part of the Aorta and Vena Cava, Vena Azygos, and Thoracic Duct.
 - 13 The large extremity of the Stomach, the Spleen, the narrow extremity of the Pancreas, the Renal Capsule, upper part of the left Kidney, and part of the Colon.
 - 14 The right Lobe of the Liver, Gall-bladder, a portion of the Duodenum and of the Ascending Colon, the Renal Capsule, and part of the right Kidney.
 - 15 If a line be carried from the highest point of the Crista of the Ilium on one side to a corresponding point on the opposite side, and the same line continued round the body, it will indicate the middle Zone; this Zone, with the upper one, forms the boundaries within which is situated the Umbilical and Lumbar Regions.
 - 16 A portion of the Omentum and Mesentery, the transverse portions of the Colon and Duodenum, and some of the convolutions of the Jejunum.
 - 17 The Ascending Colon, lower half of the Kidney, and a portion of the Jejunum.
 - 18 The descending Colon, lower half of the Kidney, and a portion of the Jejunum.
 - 19 All that portion below the line which extends from the highest point of the Crista of the Ilium on one side to the opposite one, and to the centre of Poupart's Ligament on each side.
 - 20 Convolutions of the Ilium, the Bladder (if distended), and, in females, the Uterus.
 - 21 The Cæcum, Ilio-cæcal Valve, Ureter, and Spermatic Vessels.
 - 22 The Sigmoid Flexure of the Colon, Ureter, and Spermatic Vessels.
 - 23 The Peritoneum. PERITONEUM.
 - 24 This Membrane is divided into two parts—a Parietal and a Visceral Layer, the former lines the inner Wall of the Abdominal Cavity, whilst the other is reflected over, invests and supports all the Viscera, except where the Vessels enter.

- 25 In structure similar to the Pleuræ.
- 26 When detached from its natural surface it is rough.
- 27 It has a smooth and polished appearance.
- 28 By a Serous Fluid, secreted by the Exhalant Vessels.
- 29 The Folds or Processes of this Membrane in connection with the Stomach are called Omenta, of which there are three; one, attached to the upper curve, is called the small or Gastro-hepatic Omentum; another, attached to the greater curve is called the Gastro-colic or great Omentum; and the third, to the Cardiac extremity of the Stomach is called the Splenic Omentum.
- 30 The great Omentum.
- 31 The Meso-cæcum, the Ascending and Descending Meso-colon, and the Transverse Meso-colon.
- 32 The Mesentery.
- 33 The Suspensory or Falciform Ligament, the Coronary Ligament, the left lateral and right lateral Ligaments.
- 34 The Hepatic Artery, the Ductus Communis Choledochus, the Hepatic Plexus of Nerves, the Portal Vein, and Lymphatics.

ABDOMEN.

- 35 It contains, besides the Peritoneum, the organs of Digestion and Chylification, viz: the Stomach, Intestines, Liver, Pancreas, and Spleen; also, the Kidneys, their Capsules, and Ureters.

THE STOMACH.

- 36 The hollow Musculo-membranous Viscus, into which the food is received and digested.
- 37 It is of a somewhat conical form, and situated in the left Hypochondriac and Epigastric Regions, and partly in the right Hypochondriac Region.
- 38 It is divided into a Splenic and Pyloric extremity, a greater and lesser Curvature, an anterior and posterior surface, and a Cardiac and Pyloric Orifice.
- 39 The left or Splenic extremity.
- 40 The Œsophagus.
- 41 It lies beneath the Ribs, and connected to the concave surface of the Spleen by a Fold of Peritoneum (the Splenic Omentum).
- 42 Into the Duodenum, at the under surface of the Liver.
- 43 The great Curvature, which is chiefly convex.
- 44 A Fold of the Peritoneum, called the Epiploon or greater Omentum, which floats over the Intestine.
- 45 The lesser Curvature, which is concave.

- 46 A Fold of Peritoneum, called the lesser Omentum, which is connected with the inferior surface of the Liver.
- 47 Forwards and upwards, and in contact with the Diaphragm, the Abdominal Parietes, and under surface of the Liver.
- 48 Downwards and backwards, and is in relation with the Crura of the Diaphragm, the Pancreas, the Aorta, part of the Duodenum, the Ascending Layer of the Transverse Meso-colon, the right Kidney and its Capsule.
- 49 Two; the Cardiac and Pyloric Openings.
- 50 The Pyloric is situated lower, and directed more forward, than the Cardiac.
- 51 It consists of four Coats or Layers—a Peritoneal or Serous, a Muscular, a Fibrous, and a Mucous Coat.
- 52 It forms a complete covering to the Stomach, except at the margins, which give attachment to the greater and lesser Omentum.
- 53 The Vessels, Nerves, and Lymphatics.
- 54 Immediately beneath or within the Serous Coat.
- 55 Three: a longitudinal, circular, and oblique set.
- 56 Those of the Oesophagus, and continued to the Pylorus and small Intestine.
- 57 These form the second Layer extending from the Cardiac to the Pyloric extremity of the Stomach.
- 58 A Ring or Constriction around the Orifice (the Sphincter of the Pylorus).
- 59 They are continuous with the circular Layer.
- 60 A Cellular or Connective Tissue, which gives strength to the Stomach, and forms a bed in which the larger Vessels and Nerves ramify, ere they are distributed to the Mucous or inner Coat.
- 61 It somewhat resembles a pile of velvet, being smooth and soft to the touch, and extremely Vascular, and in its natural state of a pale rose colour.
- 62 Long tubular Glands, existing in every part of the Mucous Membrane.
- 63 The Mucous Coat (and, according to some anatomists, the two inner Coats) is thrown into Folds called Rugæ.
- 64 Chiefly transverse.
- 65 The Pneumogastric and Sympathetic from the Solar Plexus.
- 66 From Branches derived from the Cæliac Axis, chiefly the Gastric or Coronary, and the Hepatic; it also receives five or six Branches (the Vasa Brevia) from the Splenic Artery.

- 67 Into the Splenic Vein, and from it into the Vena Portæ, which is formed by the union of the superior Mesenteric and Splenic Veins.

INTESTINES.

- 68 From thirty to thirty-five feet long, extending from the Pylorus to the Anus.
- 69 Into the small and large Intestines.
- 70 The Duodenum, Jejunum, and Ilium.
- 71 Commences at the Pylorus and terminates in the Jejunum on the left side of the second Lumbar Vertebra.
- 72 About the breadth of twelve fingers, as its name implies.
- 73 Obliquely upwards and backwards, perpendicularly downwards, and then passes transversely across the third Lumbar Vertebra.
- 74 The common Biliary and Pancreatic Ducts.
- 75 A Fold of the Peritoneum called the transverse Meso-colon.
- 76 At the Duodenum, and terminates in the Ilium.
- 77 About twenty feet.
- 78 It forms the upper two-fifths of the small Intestine.
- 79 At the Jejunum, and terminates in the right Iliac Fossa into the Colon.
- 80 The Mesentery.
- 81 It forms the lower three-fifths of the small Intestine.
- 82 The Mesentery.
- 83 The superior Mesenteric Vessels and Nerves, the Lymphatic Glands, and Lacteals.
- 84 Like the Stomach, it consists of four Coats—a Serous, Muscular, Fibrous, and Mucous.
- 85 Yes, except at the part where the Vessels enter at which place it is reflected off to form the Mesentery.
- 86 Two: a longitudinal and a circular set.
- 87 The Duodenal or Brunner's Glands.
- 88 Soft, and covered with minute points called Villi.
- 89 The Valvulæ Conniventes vel Valves of Kerkring.
- 90 Throughout the whole of the small Intestine of an irregular form, and about one-thirtieth of an inch long.
- 91 Extensions of the Mucous Coat, consisting of a Capillary net-work of Arteries, Veins, and Lymphatics.
- 92 Four: the Duodenal, as just described; Glandulæ Aggregatæ vel Peyer's Glands; the Glands or Crypts of Lieberkühn; and the Solitary Glands.
- 93 In the Ilium, chiefly in that part which is opposite the attachment of the Mesentery.

- 94 Oval, varying from half-an-inch to two inches in length, and from twenty to thirty in number.
- 95 Longitudinal.
- 96 Small Pouches or Tubes of the Mucous Membrane, analagous to those of the Stomach, existing in great numbers throughout the small Intestine.
- 97 About one-fiftieth of an inch long, and one five-hundredth of an inch broad.
- 98 In the small Intestine, but chiefly found in the lower part of the Ilium.
- 99 Each somewhat round, and about the size of a mustard seed.
- 100 The Cæcum, Colon, and Rectum.
- 101 From five to six feet.
- 102 The Cæcum or Blind-gut is the short roomy Pouch of a rounded form, which projects below the junction of the Ilium into which it opens.
- 103 In the right Iliac Fossa, to which it is attached by a Fold of the Peritoneum called Meso-cæcum, its length is about two-and-a-half inches.
- 104 A long worm-like projection or Tube called the Appendix Vermiformis.
- 105 From two to six inches long, and of the diameter of a goose-quill.
- 106 At its posterior and inner aspect, near the extremity of the Ilium by a Fold of Peritoneum.
- 107 The Colon forms the greater part of the large Intestine, commencing at the Cæcum and terminating at the Rectum.
- 108 It is described as consisting of three parts, viz: an ascending, a transverse, and a descending Colon; the right or ascending portion passes upwards from the Cæcum out of the right Iliac Fossa through the right Lumbar Region to the under surface of the Liver, it then passes inwards and crosses the upper part of the Umbilical Region, along the greater curvature of the Stomach as far as the Spleen, this portion is called the transverse Colon; the third portion, which is called the descending Colon, commences under the the Spleen, descending through the left Lumbar Region to the left Iliac Fossa.
- 109 The Sigmoid Flexure.
- 110 By a Fold of Peritoneum—the Sigmoid Meso-colon—which attaches it to the left Iliac Fossa.

- 111 Two lunated Folds, forming the elliptic Aperture which leads from the Ilium into the Cæcum and Colon at their junction.
- 112 Each Fold is formed by the circular Muscular Fibres of the Gut with the Mucous Membrane.
- 113 The lower; by its convex margin at the junction of the Ilium and Cæcum.
- 114 The transverse Meso-colon.
- 115 Small processes of Peritoneum which contain fat, and situated in the large Intestine, especially the transverse Colon.
- 116 Crescentic.
- 117 From the superior and inferior Mesenteric Arteries.
- 118 From the superior and inferior Mesenteric and Hypogastric Plexuses.

RECTUM.

- 119 About eight inches long, & extends from the left Sacro-iliac Symphysis in front of the Sacrum to the Anus.
- 120 Into three parts, an upper, a middle, and a lower part.
- 121 From the Sacro-iliac Symphysis to about the middle of the Sacrum.
- 122 By a Fold of Peritoneum—the Meso-rectum.
- 123 The Pyriformis, and Sacral Plexus of Nerves.
- 124 Branches of the internal Iliac Artery and the Ureter.
- 125 About four inches long.
- 126 About three inches long, and extends from about the middle of the Sacrum to the tip of the Coccyx.
- 127 By its lower part with the base or triangular part of the Bladder, with the Vesiculæ Seminales, Vasa Deferentia, the Prostate Gland, and, in the female, with the Vagina.
- 128 Nearly one-and-a-half inch long, and extends from opposite the Prostate Gland to the Anus.
- 129 The Bulb and Membranous part of the Urethra, also, the Prostate Gland.
- 130 The Band of the internal Sphincter Muscle.
- 131 The Sphincter Muscles.
- 132 Like the small Intestine it consists of four Coats—a Serous, Muscular, Fibrous, and Mucous.
- 133 The front and sides of the ascending and descending Colon, and front of the Cæcum; whilst the posterior and inner border corresponds with the space between the Lamellæ of the Meso-colon.

- 134 Similar to the Stomach, having at the anterior and posterior borders, a space or interval which gives attachment to the transverse Meso-colon and the greater Omentum.
- 135 They are collected into three distinct bundles or bands, each of which are about half an inch wide, extending from the Cæcum to the Rectum, where they cease.
- 136 It is free from Villi, and more Vascular at the lower portion.
- 137 From three sources; from the superior Hæmorrhoidal Branches of the inferior Mesenteric; the middle Hæmorrhoidal from the internal Iliac and the inferior or external Hæmorrhoidal from the internal Pudic.
- 138 From the Cerebro-spinal System and the Sympathetic; its extremity (the Sphincter) is supplied by the Coccygeal Nerves.

MESENTERY.

- 139 The large and strong Fold or Duplicature of Peritoneum which forms the medium of connection between the small Intestines and the posterior Wall of the Abdomen, attached by its narrow end to the Spine from the left side of the second Lumbar Vertebra to the right Iliac Fossa, and by its other end with the small Intestine.
- 140 The superior Mesenteric Arteries, Veins, Nerves, and Lymphatics.

LIVER.

- 141 The Liver.
- 142 In the right Hypochondriac and Epigastric Regions it also extends a little into the left Hypochondriac Region.
- 143 Somewhat square; about four pounds weight; and its longest diameter about twelve inches.
- 144 By four Folds of Peritoneum called Ligaments.
- 145 On the convex surface of the organ,
- 146 The Suspensory or Falciform Ligament, the Coronary and the two lateral Ligaments.
- 147 Between the upper or convex surface of the Liver and the Abdominal Parietes.
- 148 The remnant of the Umbilical Vein called the Round Ligament.
- 149 The Falciform Ligament.
- 150 The Diaphragm.
- 151 Between the lateral Ligaments, and connects the posterior part of the Liver to the Diaphragm.

- 152 Above the edge of the left Lobe.
 153 Above the edge of the right Lobe.
 154 Of a red-brown colour, and firm consistence.
 155 Two: a superior and an inferior.
 156 Convex.
 157 Irregularly concave.
 158 Three Fissures, five Lobes, and three Fossæ.
 159 The transverse or Portal Fissure, the longitudinal Fissure, and the Fissure or Groove for the Vena Cava.
 160 It occupies the middle third of the transverse diameter of the Liver.
 161 The Vena Portæ, Hepatic Artery, Hepatic Duct with the Nerves and Lymphatics.
 162 This Fissure or deep Groove extends from the front to the back of the Liver, between the right and left Lobes.
 163 A part of the longitudinal Fissure which extends from the terminational junction of the transverse Fissure to the posterior border of the Liver; in the adult is an obliterated Fibrous Cord or Ligament, which is the remnant of the Ductus Venosus of the Fœtus.
 164 Posteriorly at the extremity of the last named Fissure (the longitudinal) between the great Lobe and the Lobulus Spigelii.
 165 The right Lobe, the left Lobe, the square Lobe, the Spigelian Lobe, and Caudate Lobe.
 166 The right Lobe.
 167 By the longitudinal Fissure.
 168 By the longitudinal or Falciform Ligament.
 169 Projections from the right Lobe.
 170 The Gall-bladder.
 171 Convex.
 172 Concave.
 173 Between the Gall-bladder and longitudinal Fissure.
 174 Anteriorly, by the free margin of the Liver; posteriorly, by the Portal Fissure; on the right side, by the Gall Bladder; and on the left, by the longitudinal Fissure.
 175 Behind the Portal Fissure.
 176 Anteriorly, by the Portal Fissure; on the right side, by the Vena Cava inferior; and, on the left, by the longitudinal Fissure.
 177 A slightly elongated appendage to the Lobus Spigelii.
 178 The Fossæ for the Fundus of the Gall-bladder, another for the Colon, and the third for the Kidney.

- 179 On the under surface of the right Lobe of the Liver.
- 180 Parallel with the longitudinal Fissure to the right of the Lobus Quadratus.
- 181 Near the anterior part of the right Lobe.
- 182 Near the posterior part of the right Lobe; it is in relation with its anterior surface.
- 183 Two: an anterior and a posterior.
- 184 This border is free and thin, and presents two Notches, one indicating the commencement of the longitudinal Fissure, and the other lodges the Fundus of the Gall Bladder as just stated.
- 185 The right.
- 186 The Diaphragm and right Kidney.
- 187 Hepatic Duct, Hepatic Artery, Portal Vein, Hepatic Veins and Lymphatics.
- 188 The Hepatic Duct, Hepatic Artery, and Portal Vein.
- 189 By the minute Ramusculi in the Lobules of the Liver, which ultimately form two Branches, one from each Lobe, which soon become united, and, by their union, form the common Hepatic or Biliary Duct.
- 190 At its transverse Fissure.
- 191 The Vaginal, Inter-lobular, and Lobular Branches.
- 192 The Vaginal Branches, forming the Vaginal-hepatic Plexus.
- 193 The Lobular and Inter-lobular Branches.
- 194 Direct from the Vaginal-hepatic Plexus, and some from the Biliary Duct itself.
- 195 Chiefly from the Inter-lobular, and some from the Vaginal-biliary Plexus.
- 196 In a sheath called the Capsule of Glisson.
- 197 A Layer of Cellular Tissue which encloses the Vessels (viz: the Hepatic Duct, Hepatic Artery & Portal Vein) which enter the Liver through the transverse Fissure.
- 198 They accompany the small Inter-lobular and Lobular Vessels, and form the Capsules of the Lobules.
- 199 Two: an external or Fibro-muscular and an internal or Mucous.
- 200 The substance of the Liver, consists of a collection of minute secreting bodies called Lobules vel Acini; a connecting medium called Glisson's Capsule; the ramifications of the Hepatic Duct, Hepatic Artery, Portal Vein, Hepatic Veins, Lymphatics and Nerves; and the whole organ surrounded and retained in its situation by a Fibrous and a Peritoneal Coat.

- 201 No, not at the points of reflection of the Falciform, Coronary, and lateral Ligaments, nor in the depressions occupied by the Vessels, nor the surface covered by the Gall-bladder.
- 202 Yes, and like Glisson's Capsule, accompanies the Vessels throughout their ramifications in the Hepatic substance.
- 203 From the Diaphragmatic and Pneumogastric Nerves and the Hepatic Plexus.
- 204 One of the three Branches derived from the Cæliac Axis and the nutritious Artery of the Liver.
- 205 The Hepatic Artery divides into two terminal Branches, which are distributed to the Liver, Stomach, first division of the small Intestine and the Pancreas.
- 206 Like the Branches of the Hepatic Duct, they are the Vaginal, Inter-lobular, and Lobular Branches.
- 207 By the union of the Splenic, and superior Mesenteric Veins.
- 208 At the transverse Fissure it divides into two Branches, and these again into innumerable secondary Branches which ramify through the Portal Canals, giving off Vaginal and Inter-lobular Veins, which end in the Lobular Venous Plexus of the Liver.
- 209 From three to four inches in length.
- 210 This Vessel acts both as a Vein and an Artery: as a Vein it receives the Blood from several of the Abdominal Viscera, viz: the Alimentary Canal, Pancreas, and Spleen; and as an Artery it ramifies through the Liver and secretes the Bile.
- 211 By the Hepatic Veins.
- 212 By Radicles in the interior of the Lobules, which communicate with the terminations of the Vena Portæ.
- 213 In the inferior Vena Cava, whilst this Vessel is situated in the posterior border of the Liver.
- GALL-BLADDER.
- 214 A reservoir or receptacle for the Bile.
- 215 In a Fossa or Depression on the under surface of the right Lobe of the Liver.
- 216 Pyriform, and in infants often cylindrical.
- 217 Into a Body, Fundus, and Neck.
- 218 The Fundus, which is directed forwards and downwards.
- 219 Nearly four inches long and one inch in breadth at its widest part (the Fundus).
- 220 A little more than an ounce.

- 221 On one side to the Liver, and on the opposite to the Peritoneum.
- 222 Three: a Serous, Muscular, and a Mucous.
- 223 No, only a partial one, covering that side only which is unattached to the Liver.
- 224 Yes.
- 225 Numerous Rugæ with intervening depressions giving it a reticulated or honey-comb appearance, it also forms at the Neck of the Sac a Spiral Valve.
- 226 The common Excretory Duct of the Liver and Gall-bladder.
- 227 By the union of the Cystic and Hepatic Ducts.
- 228 About three inches long, and terminates by opening into the small Intestine above the middle of the inner side of the Duodenum.
- 229 The Pancreatic Duct.
- 230 A little more than an inch in length.
- 231 A series of semicircular ridges (varying from ten to twenty) which are disposed obliquely around the Tube.
- 232 From a Branch of the Hepatic Artery—the Cystic.
- 233 Into the Vena Portæ.
- 234 From the Hepatic Plexus.

PANCREAS.

- 235 The long flattened Glandular body, of a greyish white colour.
- 236 It is situated behind the Stomach, extending across the Vertebral Column from the Spleen to the Duodenum, and occupying the left Hypochondriac, the Umbilical and right Lumbar Regions opposite to the second Lumbar Vertebra.
- 237 About seven inches long, and between three and four ounces in weight.
- 238 Anteriorly with the ascending Layer of the transverse Meso-colon, the Stomach, first division of the Duodenum, and first part of the transverse Arch of the Colon; and posteriorly with the Aorta, Vena Portæ, inferior Vena Cava, origin of the superior Mesenteric Artery, the Crura of the Diaphragm, left Kidney and Supra-Renal Capsule, also the Splenic Vein.
- 239 Into a body and two extremities.
- 240 The body, a little to the right of the Spine.
- 241 Nearly two inches broad and three-quarters of an inch thick.

- 242 The Head or right extremity, which is surrounded by the curve of the Duodenum.
- 243 This extremity is placed over the left Kidney, and in contact with the Spleen.
- 244 On the posterior part of the Head is a Lobular Fold of the Gland called the lesser Pancreas.
- 245 The Pancreas is a compound Gland, analogous to the Salivary Glands, of a soft and loose texture, and composed of reddish-yellow Lobules, which are united into larger masses by Cellular Tissue, Vessels and Ducts; which end in closed Vesicular or Cæcal Pouches surrounded by a Plexus of Vessels.
- 246 This Duct extends the whole length of the Gland, and commences at the smaller extremity.
- 247 In the Duodenum, conjointly with the Ductus Communis Choledochus, and sometimes it opens into the Duodenum by a separate Orifice.
- 248 Yes.
- 249 It is composed of two Coats, a Fibrous and a Mucous Coat.
- 250 With a Layer of Epithelium.
- 251 From the Cæliac Axis; viz: Branches of the Hepatic and Splenic, also, Branches from the superior Mesenteric.
- 252 To the Splenic Vein into the Vena Portæ.
- 253 From the Solar Plexus, *i.e.* Branches or Filaments from the Splenic Plexus.

SPLEEN.

- 254 The Spleen is a soft and exceedingly Vascular spongy Organ.
- 255 It is situated deeply in the left Hypochondrium, between the Stomach and Ribs.
- 256 Nearly five inches long (although very variable) about three inches in breadth, nearly two inches in thickness, and from six to ten ounces in weight.
- 257 Into two surfaces, two borders, and two extremities.
- 258 Convex, and in relation with the Diaphragm, which separates it from the ninth, tenth, and eleventh Ribs.
- 259 Concave, and in relation with the greater extremity of the Stomach, the smaller extremity of the Pancreas, with a Fold of Peritoneum called the Gastro-splenic Omentum and its Vessels, with the left Kidney and its Supra-renal Capsule, and with the left Pillar of the Diaphragm.
- 260 By Peritoneum.

- 261 The anterior border is thinner, and often marked by several Notches.
- 262 The lower extremity.
- 263 The upper, and somewhat rounded.
- 264 Accessory Spleens (Splenculi).
- 265 From the size of a bean to that of a nutmeg, two and sometimes three in number.
- 266 Two; a Serous and a Fibrous Coat, the Tunica Propria which is composed of elastic Tissue.
- 267 Yes; except at the Hilus or Fissure, and the posterior border.
- 268 Yes; it also enters the interior of the Spleen at its Fissure, forming Sheaths for the Vessels in their ramifications through the organ.
- 269 Its substance is composed of a net-work of Fibrous Tissue, containing within it the proper Splenic substance, and the Corpuscles of Malpighi, throughout which the Blood-vessels and Nerves ramify.
- 270 From a division of the Cœliac Axis—the Splenic.
- 271 To the Splenic Vein into the Vena Portæ, which latter it assists to form.
- 272 From the Splenic Plexus which is derived from the Solar Plexus.
- KIDNEYS.
- 273 Two Glandular Bodies which secrete the Urine.
- 274 In the posterior part of the Abdomen, on either side the Vertebral Column, opposite the last Dorsal and two or three upper Lumbar Vertebæ.
- 275 About four-and-a-half inches in length, two inches in breadth, one inch in thickness, and about four-and-a-half ounces in weight.
- 276 It somewhat resembles the form of a large bean, and of a deep red colour.
- 277 Into two surfaces, two borders, and two extremities.
- 278 Convex.
- 279 Flat.
- 280 The Peritoneum and Colon.
- 281 Enclosed in a quantity of fat, each rests on the Diaphragm, also in relation with the Quadratus Lumborum and Psoas Magnus Muscles, a Lamella of the Transversalis Muscle intervening.
- 282 Convex.
- 283 Concave and excavated in the middle by a deep Fissure (for the transmission of the Vessels called the Hilum vel Hilus Renalis.)

- 284 The inferior, which is in relation with the Crest of the Ilium.
- 285 The Supra-renal Capsule.
- 286 The right Kidney is a little lower than the left, owing to the position of the Liver.
- 287 The Duodenum (its descending portion).
- 288 The lower end of the Spleen.
- 289 The Vessels and Nerves of the Kidney.
- 290 Into a Sinus in the interior of the Kidney.
- 291 The Vessels and Duct.
- 292 The most anterior is the Renal Vein, the most posterior the Ureter or Duct, and, between the two, the Renal Artery.
- 293 It consists of a mass of minute Secretory Tubes, with Blood-vessels, Nerves, Lymphatics, and fine Cellular Tissue.
- 294 It consists of two substances, an external or Cortical, and an internal Tubular or Medullary substance (the latter named Pyramidal Masses vel Pyramids of Malpighi.)
- 295 This substance, which occupies the whole circumference of the organ, forms about three-fourths of the Kidney.
- 296 Of a red colour, and soft consistence.
- 297 The convoluted Uriniferous Tubuli and the Capillary terminations of the Blood-vessels.
- 298 Malpighian Bodies dispersed here and there through its substance.
- 299 This portion consists of from ten to sixteen or eighteen pale reddish coloured Pyramidal or Conical Bodies, which converge to the Sinus of the Kidney.
- 300 In small, nipple-like projections called Papillæ or Mamillary Processes.
- 301 By the expansion or dilatation of the Ureter.
- 302 Funnel-shaped.
- 303 Three : one corresponding with each extremity of the Kidney and the third with the middle of the organ.
- 304 They subdivide into smaller Tubes, varying from eight to twelve in number, which are called the Infundibuli.
- 305 In cup-like Pouches called Calices.
- 306 Two or more of the Papillæ or Mamillary Processes already referred to.
- 307 They unite together to form two or three larger Tubes, which become blended in the Excretory Duct, as just stated.

- 308 The ultimate terminations of the Ureter.
 309 Small Globular Bodies which exist in the dilated Sacs of the Uriniferous Tubes.
 310 By the ramifications of the Capillary Vessels (the Afferent and Efferent Branches of the Renal Artery.
 311 One, fibrous.
 312 From the Renal Arteries, which are derived from the Aorta.
 313 To the Renal Veins, which open into the inferior Vena Cava.
 314 From the Renal Plexus, which is formed by the Solar Plexus and lesser Splanchnic Nerve.

URETERS.

- 315 The Ureter; (the Pelvis is nothing more than the dilated funnel-shaped part of the Ureter.)
 316 From sixteen to eighteen inches in length, and its size about the diameter of a goose-quill.
 317 It descends obliquely downwards and inwards along the posterior Wall of the Abdomen as far as the Pelvis (at the sides of the anterior part of the Os Sacrum) where it becomes horizontal in its course into the posterior false Ligament, entering the Bladder near its side and lower part about two inches from the Prostate Gland.
 318 The Psoas Muscle and the common and external Iliac Arteries; and in the Pelvis, the Umbilical Artery and Vas Deferens in the Male, and the upper part of the Vagina in the Female.
 319 It consists of two Coats, an external or Muscular, and an internal or Mucous Coat.
 320 Into an external or longitudinal, and an internal or circular set.
 321 It is thrown into longitudinal Folds.
 322 About one inch-and-a-half on either side, and behind the Orifice of the Urethra.
 323 About one-inch-and-a-half.
 324 Obliquely.
 325 Owing to their oblique course, which extends about half-an-inch, ere they open into the Bladder.

SUPRA-RENAL CAPSULES.

- 326 Two small flattened and yellowish coloured bodies, which surmount the Kidneys.
 327 Somewhat triangular.
 328 Convex.

- 329 Excavated where it is in contact with the Kidney.
 330 About one-and-a-half inch wide, and about a drachm and a half in weight.
 331 The Liver.
 332 The Pancreas and Spleen.
 333 The inferior Vena Cava.
 334 The Solar Plexus.
 335 The Aorta.
 336 The Solar Plexus.
 337 A vertical section shows it to consist of two parts—an external or Cortical, and an internal or Medullary part.
 338 A yellowish colour, and consists of straight parallel fibres.
 339 A dark brown colour, and of a soft texture.
 340 The Supra-renal Vein.
 341 From the Aorta and the Phrenic and Renal Arteries.
 342 Into the inferior Vena Cava on the right side, and the Renal Vein on the left side.
 343 From the Solar Plexus, viz: the Renal and Phrenic Plexuses.
 344 Yes.

SECTION XXV.—CAVITY OF THE PELVIS.

- 1 All that part within the Bones of the Pelvis below its brim or inlet.
- 2 Above by the margin or brim which extends from the Tuberosities of the Ossa Pubis outwards and backwards to the Promontory of the Sacrum, below towards the Perineum; the Cavity is formed by the Pelvic Fascia and the Levatores Ani et Coccygei Muscles, anteriorly and laterally by the Ossa Innominata and Obturator Muscles, and posteriorly by the Sacrum, Coccyx, and Sacro-ischiatic Ligaments.

PELVIC VISCERA.

- 3 In the Male, the Urinary Bladder and its Excretory Tube (Rectum already described) the Prostate Gland, the Seminal Vesicles and their Ducts, with the Vessels and Nerves: in the Female, the Bladder, Urethra, (Rectum already described), and the Generative Organs, viz: the Uterus (with its appendages), and the Vagina, with their Vessels and Nerves.

URINARY BLADDER.

- 4 The large Membranous Viscus, which serves as a Reservoir for the Fluid secreted by the Kidneys.
- 5 Behind the Ossa Pubis and before the Rectum.
- 6 When empty or contracted it is somewhat of a triangular

- form, but when distended it is somewhat ovoid, with its larger part inclined towards the Rectum, and the apex or small part towards the Abdominal Wall.
- 7 Into a Body, Neck, Apex, and Base or Fundus.
 - 8 The middle Zone of the Viscus.
 - 9 With the posterior part of the Symphysis Pubis.
 - 10 Peritoneum.
 - 11 The narrow constricted portion of the Viscus that joins the Urethra.
 - 12 By the Prostate Gland.
 - 13 Three Ligamentous Cords which are prolonged to the Umbilicus.
 - 14 The Urachus, which is formed by the obliteration of a Tubular Canal, which is present in the Embryo, extending from the Apex to the Umbilicus.
 - 15 The Umbilical Ligaments, and formed by the obliterated Hypogastric Arteries of the Fœtus, extending from the base on either side to the Umbilicus.
 - 16 When full, the apex is above the Pubes; when contracted, it is below the Pubes.
 - 17 This large portion rests on the middle part of the Rectum.
 - 18 The Vesiculæ Seminales and Vasa Deferentia.
 - 19 Triangular.
 - 20 No.
 - 21 Only Cellular Tissue.
 - 22 By the sides being formed by the Vesiculæ Seminales converging to the Prostate Gland, whilst the base corresponds with the interval between the Ureters.
 - 23 By Ligaments, which are divided into true and false.
 - 24 Seven: two anterior, two lateral, two Umbilical, and the Urachus (the three last have just been described.)
 - 25 By the Pelvic Fascia, which is derived from the Fascia Iliaca, it extends from the inner surface of the Os Pubis on either side its Symphysis to the front of the Bladder.
 - 26 By the reflection of the Pelvic Fascia from the Levatores Ani Muscles upon the sides of the base of the Bladder.
 - 27 Four: two anterior and two posterior, formed by Folds of Peritoneum.
 - 28 From the sides of the Bladder to the Iliac Fossæ and Walls of the Pelvis.
 - 29 They correspond with the course of the obliterated Hypogastric Arteries from the upper part of the Bladder to the Abdominal Wall.

- 30 Four: an external or Serous, a Muscular, a Fibrous, and a Mucous Coat.
- 31 No; only a partial one, which covers the posterior surface and sides of the organ as far as the position of the obliterated Umbilical Arteries, where it becomes reflected from thence to the Pelvic and Abdominal Parietes.
- 33 All the anterior surface.
- 34 Two: longitudinally and circularly.
- 35 From the apex to the base of the organ.
- 36 The external or outer Layer of Muscular Fibres.
- 37 In a circular manner, and towards the Neck of the organ are collected into a thick bundle called the Sphincter Vesicæ.
- 38 Yes, and then form projections on the inner surface of the organ constituting the Fasciculated Bladder.
- 39 Between the Muscular and Mucous Coats.
- 40 It is composed of elastic Tissue, in which the Blood Vessels ramify.
- 41 This Coat is thin and smooth, occupying the whole of the internal surface, it is continuous with that of the Ureters posteriorly, and anteriorly with that of the Urethra.
- 42 A thin Stratum or Layer called the Sub-mucous or Nervous Coat.
- 43 Smooth.
- 44 Corrugated or thrown into numerous Folds, except over a small triangular space behind the opening into the Urethra, which is smooth in all conditions of the organ, and called Trigonum Vesicæ.
- 45 The Trigone Vesicale.
- 46 On either side by a line extending from the Urethra to the Ureter, and by a transverse line behind between the Ureters.
- 47 Triangular.
- 48 No; a thin Fibrous Membrane intervenes, called the Recto-vesical Fascia.
- 49 On either side by the Vas Deferens and Vesicula Seminalis, which converge to a point at the base of the Prostate Gland; and behind by a Fold of Peritoneum (the Recto-vesical Fold.)
- 50 The Recto-vesical operation for puncture of the Bladder.
- 51 Three at the lower part of the Bladder; the Openings of the Urethra and the two Ureters.
- 52 The Opening of the Urethra.

- 53 By a thickening of the Sub-mucous Layer called Uvula Vesicæ.
 54 In front of the middle Lobe of the Prostate Gland.
 55 From Branches derived from the anterior Trunk of the internal Iliac Artery.
 56 Into its Veins which pass into the internal Iliac Veins.
 57 From the Spinal and Sympathetic Nerves.

URETHRA.

- 58 The long Membranous Canal which extends from the Neck of the Bladder to the extremity of the Penis.
 59 From eight to nine inches in length, and Sigmoid in its course.
 60 Two: a Mucous & a Sub-mucous or elastic Fibrous Coat.
 61 Internally, with the Mucous Membrane of the Bladder and the Ducts leading into the Canal, *e.g.* the Ducts of Cowper's Glands, the Prostate, Vasa Deferentia, &c.; and externally with the Tegumentary Covering of the Glans Penis.
 62 The Spongy and Membranous parts of it are thrown into longitudinal Folds.
 63 Yes, with a Layer of Epithelium.
 64 Longitudinally, & blended with elastic & Fibrous Tissues.
 65 The Prostatic.
 66 In the Membranous part, and in the Spongy part it is very thin.
 67 Into three parts, according to the structures which surround them—the Prostatic, Membranous, and Spongy.
 68 It is situated in the Prostate Gland, and nearly one inch and a half in length.
 69 The Veru Montanum vel Caput Gallinaginis and Crest.
 70 The Prostatic Sinus, into which the greater number of the Ducts of the Prostate, open.
 71 At the anterior extremity of the Veru Montanum.
 72 The Sinus Pocularis vel Vesicula Prostatica.
 73 A blind Pouch or Cæcal Appendage to the Canal.
 74 Downwards and backwards, into the Prostate Gland.
 75 The Prostatic part.
 76 Spindle-shaped, being larger in the middle than at either extremity.
 77 The Membranous part, the Orifice of the Urethra excepted.
 78 Nearly one inch long, and situated between the two Layers of the deep Perineal Fascia, intervening between the apex of the Prostate Gland posteriorly, and the spongy portion of the Canal anteriorly.

- 79 The Membranous portion, which is supported by the Perineal Triangular Ligament.
- 80 Mucous Membrane, a Sub-mucous or elastic Fibrous Layer, the Compressor Urethræ Muscle, and a partial Covering from the deep Perineal Fascia, it is also in relation with the Rectum posteriorly.
- 81 Nearly five inches and a half in length, extending from the Membranous part anteriorly to the extremity of the Penis or Meatus Urinarius.
- 82 In the Corpus Spongiosum Penis.
- 83 The middle Fibres of the Accelerator vel Ejaculator Urinæ.
- 84 Into a body and two extremities.
- 85 The body.
- 86 A dilatation called the Sinus of the Bulb.
- 87 A dilatation called the Fossa Navicularis.
- 88 Throughout the internal surface of the spongy part of the Urethra, but chiefly along its floor.
- 89 On the upper surface or roof of the spongy division of the Urethra opposite to the Fossa Navicularis, and about one inch and a half from the Opening of the Meatus Urinarius.
- 90 Just below the Membranous part of the Urethra on either side the middle line behind the Bulb.
- 91 Numerous minute Lobules.
- 92 On the Floor of the Urethra just before the Bulb, and nearly an inch in length.
- 93 About the size of Peas, and two in number.
- 94 No; they diminish in size as age advances.

PROSTATE GLAND.

- 95 A firm Musculo-glandular body which secretes a whitish ropy Mucus.
- 96 Deeply in the Pelvis, behind the Perineal Fascia and beneath the Pubic Arch; and enclosing part of the Neck of the Bladder and beginning of the Urethra.
- 97 That of a Spanish chesnut, with its base looking backwards, its apex forwards, and its convex side towards the Rectum.
- 98 About one ounce.
- 99 Its upper and lower surfaces by the two superior and two inferior Ligaments of the Bladder, and by its apex to the Pelvic Fascia.
- 100 Three Lobes: two lateral and a middle Lobe.
- 101 By an indentation on the base or under surface, and by a slight depression on the upper surface.

- 102 A small piece of the Gland, which extends transversely between the lateral Lobes at the base of the organ.
- 103 The middle Lobe.
- 104 The centre of the posterior part or base.
- 105 At the base and apex.
- 106 Obliquely.
- 107 A section of the Gland presents a reddish colour, and its substance is composed of Fibrous and Muscular Tissue interspersed with Glandular structure; a microscopic examination gives it a Cellular appearance, owing to the minute Ducts ramifying in it, and which terminate in Lobules.
- 108 It forms about one third of the Gland.
- 109 No, they vary in number from fifteen to twenty, which open in the Prostatic portion of the Urethra on either side the Veru Montanum.
- 110 Two: a Fibrous and Muscular Coat.
- 111 Circularly.
- 112 Yes, it obtains one from the Recto-vesical Fascia.
- 113 From Branches derived from the anterior Trunk of the internal Iliac Artery, viz: the middle Hæmorrhoidal and the lower Vesical.
- 114 A Plexus, which communicates anteriorly with the Dorsal Vein of the Penis; and posteriorly with a Plexus at the base of the Bladder.
- VESICULÆ SEMINALES.
- 115 Two small Membranous Sacs situated at the under surface of the Bladder, between its base and the Rectum.
- 116 About two inches in length, and of a Pyramidal form.
- 117 The base of the Bladder.
- 118 The Rectum; the Recto-vesical Fascia intervening.
- 119 A triangular space.
- 120 By the divergence of the Vesiculæ from each other posteriorly, and their convergence anteriorly at the Prostate Gland.
- 121 By the Recto-vesical Fold of Peritoneum.
- 122 The Trigonum Vesicæ on the inner surface of the Bladder.
- 123 Formed by the convolution of a single Tube, which gives off laterally several Cæcal Branches or Pouches, which are united together by Fibrous Tissue.
- 124 Two: an external or Fibrous Coat, which is derived from the Pelvic Fascia; and an internal one, analogous to Mucous Membrane.
- 125 In a closed extremity.

- 126 In a narrow Tube, which uniting with the Vas Deferens forms on either side the common Duct (Ductus Ejaculatorius).
- 127 Beneath the middle Lobe of the Prostate.
- 128 Unknown ; but, according to some, they secrete a fluid, according to others, they are supposed to act as Reservoirs for the Seminal Secretion.

MALE ORGANS OF GENERATION.

- 129 The Penis and Testes with their Appendages.
- 130 The cylindrical body attached to the anterior part of the Pelvis, and suspended from it anteriorly to the Scrotum.
- 131 Into three parts: a body, root, and extremity.
- 132 By the union of its two Corpora Cavernosa.
- 133 By a loose Tegumentary Investment, which is continuous with the Abdomen posteriorly, and anteriorly forms the Prepuce.
- 134 It is free from Adipose Tissue.
- 135 The posterior division, which is attached to the Rami of the Os Pubis et Ischii by its two Crura, and to the Symphysis by its Suspensory Ligament.
- 136 An obtuse cone.
- 137 The Corona Glandis.
- 138 By a circular Fold of Integument or covering called the Prepuce (Præputium) which in the distended condition of the organ is effaced, but in the quiescent or loose state can be drawn over the Glans Penis.
- 139 The Frænum Præputii.
- 140 Glandulæ Tysoni vel Glandulæ Odoriferæ.
- 141 Mucous Membrane covered by the Cuticle.
- 142 At the base of the Glans, and on reaching the Meatus Urinarius is continuous with its Mucous Lining.
- 143 By two firm, fibrous bodies called Corpora Cavernosa (one on either side called Corpus Cavernosum) and the Corpus Spongiosum.
- 144 The Corpus Cavernosum divides posteriorly into two Processes called Crura, which are attached to the Rami of the Os Pubis and Ischii as just stated.
- 145 Near the union of the two Corpora Cavernosa posteriorly is a small swelling called the Bulb.
- 146 It forms a rounded extremity, which is received into a Fossa in the base of the Glans Penis.

- 147 Superiorly, by an imperfect Septum called Septum Pecteniforme, which lodges the large Dorsal Vein; and inferiorly, by the Urethral Canal & Corpus Spongiosum.
- 148 It consists of a thick, fibrous and elastic Sheath, which encloses a Cavernous Trabecular or net-work structure, within which a Plexus of Vessels ramify, especially Veins.
- 149 The Fibres of the external Layer of this Sheath are disposed longitudinally, and the inner circularly.
- 150 Numerous elongated or vertical Fissures which give it the appearance of a comb, hence called Septum Pecteniforme.
- 151 By the circular Fibres of the Corpora Caverosa.
- 152 Like the Corpus Cavernosum it is a Vascular and Erectile Tissue enclosed in a Fibrous Tissue.
- 153 It commences posteriorly by an enlargement called the Bulb, terminates anteriorly by another expansion, which forms the Glans Penis.
- 154 Almost cylindrical.
- 155 The deep Perineal Fascia or triangular Ligament, which is just behind, and attached to it by its anterior Layer.
- 156 The spongy part or division of the Urethra.
- 157 Circularly.
- 158 The vertical Fissure or Orifice of the Urethra.
- 159 At its posterior part which is marked by the prominent border or collar called the Corona Glandis.
- 160 From Branches derived from the internal Pudic Artery external to the Pelvis, the Arteria Bulbosi, Arteria Corporis Caverosi, and Arteria Dorsalis Penis.
- 161 The superficial Veins return their Blood into the large Dorsal Vein, which terminates in the Prostatic and Vesical Plexuses, and the deep Veins terminate in the internal Pudic Vein.
- 162 From the Hypogastric Plexus and from the Pudic Nerve which is derived from the Sacral Plexus.

TESTES.

- 163 Two Glandular Bodies suspended from the Abdomen by the Spermatic Cords and their Coverings, and lodged in an external Tegumentary Covering called the Scrotum.
- 164 Of an oval form with flattened sides, and secrete the Semen.
- 165 Situated obliquely, and the left is the lowest.

- 166 About one inch and a half in length; from side to side nearly an inch; and weighs from six to eight drachms.
- 167 Its substance consists of a great number of minute conical Tubes, whose bases are directed towards the surface, and the apices towards the Mediastinum; around which the Blood-vessels are arranged in Plexuses.
- 168 Each is invested by two Layers, one derived from the Tunica Vasculosa, and the other from the Tunica Albuginea.
- 169 Two: the Tunica Vaginalis, and the Tunica Albuginea.
- 170 A distinct Sac derived from the Peritoneum, which invests the Testis as the Pericardium does the Heart, &c., and therefore a shut Sac.
- 171 Into the Tunica Vaginalis Propria and the Tunica Vaginalis Reflexa.
- 172 Yes; except posteriorly, where the Vessels enter or leave it.
- 173 The reflected or Parietal portion, which lines the contiguous Layer of the Scrotum.
- 174 Between its two Layers the surface is smooth, and secretes a Fluid.
- 175 The Tunica Propria vel Dura Mater of the Testis.
- 176 It is of a bluish-white colour, analogous to the Sclerotic Coat of the Eye, dense and fibrous; its fibres present a net-work appearance, interlacing in all directions; from its unyielding nature it maintains the shape of the Testis.
- 177 Yes; and one of them, larger than the rest, is called Mediastinum Testis vel Corpus Highmorianum.
- 178 It serves to lodge the Seminal Ducts and Blood-vessels in their passage into the substance of the Testis.
- 179 In a transverse section of the organ it will be observed that the Ducts are situated near to the free margin of the Mediastinum, whilst the Blood-vessels are situated near its posterior border.
- 180 This Layer (the Pia Mater Testis) is situated immediately within the Tunica Albuginea, and is the thin Vascular or Nutrient Layer of the Testis.
- 181 Yes; and lines the Fibrous Processes of the Tunica Albuginea.
- 182 By the ultimate ramifications of the Spermatic Blood-vessels, which are united by Cellular Tissue.

- 183 A pulpy, soft, and dark yellow substance, divided into Lobes.
- 184 A great number of minute Tubes, which do not communicate with each other, but end in Loops or Cæcal Pouches (Tubuli Seminiferi).
- 185 They vary; some contain only one, others several.
- 186 According to Monro, between three and four hundred in each Testis, and their length about sixteen feet.
- 187 By a closed extremity, as just stated.
- 188 Straight; hence called Tubuli Recti vel Vasa Recta, which, according to their situation, constitute the the second order of Seminal Vessels, between twenty and thirty in number.
- 189 The anterior part.
- 190 The Blood-vessels.
- 191 The Rete-testis, from ten to fourteen in number.
- 192 Vasa Efferentia, which, from their convolutions, form conical masses called Coni Vasculosi.
- 193 From ten to thirty in number.
- 194 The common Excretory Duct vel Vas Deferens.
- 195 The Epididymis constitutes the first part of the Vas Deferens which is in contact with the Testis; it consists of a single tube much convoluted, its first or larger extremity which is called the Head vel Globus Major is opposite to the upper part of the Testis, and the lower extremity which is called Cauda vel Globus Minor is opposite to the lower part of the Testis, the narrow intervening part is called the Body.
- 196 The Testis, by the Vasa Efferentia which open into it.
- 197 Small Fibrous Bands derived from the Tunica Albuginea.
- 198 The Excretory Duct of the Testis which extends from the Testis to its termination in the Urethra.
- 199 The first part of it which is called Epididymis is tortuous, & the remainder which forms the Vas Deferens loses this flexuous appearance; it extends from the termination of the Globus Minor of the Epididymis ascending on the inner side of the Testis along the posterior part of the Spermatic Cord and its canal, through the Abdominal Ring where it passes inwards by the side and under part of the Bladder to terminate at the base of the Prostate Gland where it forms with the Duct of the Vesicula Seminalis, the common Seminal or Ejaculatory Duct which opens in the Prostetic portion of the Urethra as already noticed.

- 200 The Vas Aberrans of Haller.
 201 About twelve inches.
 202 Nearly two feet.
 203 It is composed of a dense, thick, muscular coat which is lined internally by Mucous Membrane.
 204 Longitudinally and circularly: the longitudinal forms two Layers, an external and an internal Layer and between the two are placed the circular Fibres.
 205 In the straight part of the Duct it forms longitudinal ridges, and in the other or Sacculated part they are very irregular.
 206 The Vas Deferens.
 207 Similar to the Vas Deferens.
 208 From the Branches of the Spermatic Arteries, which latter arise from the front of the Aorta.
 209 Into the Spermatic Veins.
 210 Into the Inferior Vena Cava.
 211 Into the Left Renal Vein.
 212 From the Sympathetic System (the Spermatic Plexus.)

SCROTUM.

- 213 The Scrotum is the purse-like investment which is devoid of Adipose Tissue and formed by the continuation of the Integuments.
 214 Into two lateral halves, by a projecting line called the Raphe, which is continued anteriorly along the under surface of the Penis, and posteriorly along the middle line of the Perineum to the Penis.
 215 The left.
 216 Two Layers: an external or Integumentary, and an internal or Dartoid (Tunica Dartos.)
 217 Very thin and transparent and thrown into several Rugæ or Folds, and furnished with several Sebaceous Follicles and scattered hairs, which latter issue obliquely from it.
 218 A thin lamella of superficial Fascia which contains involuntary Muscular Fibres, and which causes the skin to corrugate.
 219 The proper covering or Tunic of the Scrotum sends inwards a Septum which separates the two Cavities of the Testis called Septum Scroti.

SPERMATIC CORD.

- 220 The medium of communication between the Testis and the interior of the Abdomen.

- 221 The Vessels (viz: Arteries, Veins, Lymphatics, and Nerves) and the Efferent or Excretory Duct, united together by the proper coverings.
- 222 At the internal Abdominal Ring and escaping at the external Abdominal Ring, descends through the Scrotum to the posterior border of the Testis.
- 223 Like the Scrotum: the Left.
- 224 The Septum Crurale, the Fascia Propria, the Cremasteric covering, the Inter-columnar or Spermatic Fascia, the superficial Fascia and Skin.
- 225 That portion of Sub-peritoneal Layer of Fat which stretches over the Crural Ring is called Septum Crurale from its position between the Thigh & Abdomen.
- 226 A prolongation of the Inter-columnar Fascia, which is derived from the external oblique Muscle during the descent of the Testis in the Fœtus.
- 227 A thin Muscular expansion derived from the Cremaster, which is also carried down by the Testis in the Fœtus.
- 228 This covering is derived from the Infundibuliform process of the Transversalis Fascia, and also obtained during the descent of the Testis.
- 229 From the Spermatic Arteries.
- 230 Into the Spermatic Veins.
- 231 From the Spermatic Plexus of the Sympathetic.
- 232 The Cremasteric Branches from the Epigastric.
- 233 The Genital Branch of the Genito-crural Nerve which latter is derived from the Lumbar Plexus.

FEMALE ORGANS OF GENERATION.

- 234 From their position, into two classes external & internal.
- 235 The Vulva or Pudendum consists of the Mons Veneris and external Labia, the Clitoris and internal Labia, together with the Vestibule and the Orifice of the Urethra.
- 236 The aperture of the Vagina, with the Hymen or some small rounded projections as the result of the rupture of the Hymen called Carunculæ Myrtiformes.
- 237 On the front of the Os Pubis the Integument is elevated with Cellular and Adipose Tissue, this is the Mons Veneris, whose surface is covered with hair.
- 238 Two longitudinal folds of Integument extending from the Mons Veneris to within an inch-and-a-quarter of the Anus, consisting of Cellular and Adipose Tissue, and studded externally with hair.

- 239 Two folds: enclosing an elliptical Fissure, the Rima, or Urino-sexual Opening.
- 240 Two Commissures: the union of the Labia just below the Mons Veneris, is called the superior Commissure, and their points of junction before the Perineum the inferior Commissure.
- 241 The Fourchette, vel Frænulum Labiorum.
- 242 The Fossa Navicularis.
- 243 The Perinæum.

ORIFICE OF THE VAGINA.

- 244 Immediately below the Meatus Urinarius.

HYMEN.

- 245 The thin Semilunar Fold of Mucous Membrane situated at the lateral & inferior parts of the entrance of the Vagina.
- 246 Obliquely upwards.
- 247 Small and somewhat rounded masses which are formed after the rupture or destruction of the Hymen, whether the result of coition or otherwise.
- 248 It is not.

CLITORIS.

- 249 A small elongated and Erectile Body, situated in front of the Os Pubis and just below the superior Commissure of the Labia Majora.
- 250 The Penis, and like it, consists of two Corpora Caverosa (divided by an incomplete or Pecteniform Septum) which are attached by its two Crura to the Rami of the Ossa Pubis et Ischii, and anteriorly forms a Corpus Spongiosum, which is limited to the Glans Clitoridis which it forms.
- 251 Its external Casing is analogous to that of the Penis, and the interior (like that of the Penis) is composed of Erectile Tissue, which is susceptible and capable of erection.

LABIA MINORA VEL NYMPHÆ.

- 252 Two Folds of Mucous Membrane which descend obliquely outwards on either side the Clitoris, and on each side the Orifice of the Vagina.
- 253 The Preputial Covering of the Clitoris (Præputium Clitoridis).
- 254 Unlike their union superiorly, they are separated below, and lost on the sides of the Aperture of the Vagina.
- 255 Mucous Membrane, some Sebaceous Follicles, a small portion of Erectile Tissue, and covered by a thin Cuticular Epithelium.

- 256 With that of the Vagina.
 257 With the Covering of the external Labia (Labia Majora).

VESTIBULE.

- 258 The triangular smooth interval situated within the Nymphæ, between the Clitoris and the entrance to the Vagina.
 259 About an inch-and-a-half deep.
 260 The Meatus Urinarius.
 261 A small elevation or Tubercle, which readily indicates the situation of the Urethral Orifice, for the introduction of the Catheter.

URETHRA.

- 262 About one inch-and-a-half in length, and situated just above the Vagina, and about one inch below the Clitoris.
 263 Like that of the Male it consists of Mucous Membrane, Elastic and Cellular Tissue, and Muscular Fibres, with a Plexus of Blood-vessels.
 264 In longitudinal Folds.
 265 Internally with that of the Bladder, and externally with that of the Vulva.
 266 From the Muscular Coat of the Bladder (the Detrusor Urinæ).
 267 It is in close proximity to the Mucous Membrane, and is the Tissue which admits of the great dilatibility of the Female Urethral Canal.
 268 The Vagina, with the Uterus and its Appendages, viz: the Fallopian Tubes and Ovaries.

VAGINA.

- 269 The Membranous and Dilatable Tube, which extends from the Cervix Uteri to the Vulva.
 270 Between four and five inches in length, and somewhat cylindrical in form.
 271 Somewhat curved, as it follows the bend of the Rectum, its Axis corresponding with that of the Outlet of the Pelvis.
 272 The Urethra and base of the Bladder.
 273 The Rectum.
 274 The Recto-vesical Fascia.
 275 The Cervix Uteri.
 276 The Constrictor vel Sphincter Vaginæ (Perinæo Clitorius).
 277 The upper or superior extremity.
 278 No; the anterior is the shortest, between four and five inches; whilst the posterior is between five and six inches in length.

- 279 No; the lower extremity or external Orifice is the most constricted; the middle, the most dilated; and the upper or superior extremity, intermediate between the other two.
- 280 It is composed of Mucous Membrane, Erectile Tissue, and a Cellulo-fibrous or external Layer.
- 281 Several transverse Rugæ, which are most numerous at its upper surface.
- 282 A slightly-elevated line (the Raphe) which extends from before backwards, along the superior and inferior surfaces called the Columns of the Vagina.
- 283 From the lower or inferior Aperture (where it joins with the Labia Majora) to the interior of the Uterus.
- 284 Yes, with a thin Laminar or Cuticular Epithelium, which is continued from the Labia Majora, and terminates by a fringed extremity in the Cervix Uteri.
- 285 Throughout the Tube, but is thicker and more abundant at its extremities, particularly at the lower extremity, than in the middle.
- 286 That of the Dartos of the Scrotum.
- 287 Longitudinally.
- 288 Some are continued all along the Vagina; others only as far as the Recto-vesical Fascia, to which they are attached.
- 289 Yes.
- 290 Because it is less closely connected with it.
- 291 Above, in the superficial Layer of the Uterus and in the Peritoneum; and below, in the Sub-dermic Tissue.
- 292 They are elongated masses of Plexiform Veins, and called by Taylor "Semi-bulbs."
- 293 Each about one inch in length, and enclosed in Fibrous Membrane.
- 294 Above, with the Vessels of the Clitoris; and posteriorly, with the Venous Plexus of the Vagina.
- 295 Two small yellowish Glandular Bodies, which correspond with Cowper's Glands in the Male.
- 296 One on either side the outer part of the Vagina, near its Aperture at the lower extremity.
- 297 About the size of a small bean.
- 298 Each is provided with a Duct, which opens on the inner surfaces of the Nymphæ.
- 299 From the Vaginal, which are Branches of the internal Iliac.
- 300 They form Plexuses, which open into the internal Iliac Vein.

- 301 From the Sympathetic and Cerebro-spinal Systems (the Sacral and Hypogastric Plexuses).

UTERUS.

- 302 The largest of the Genital Organs, destined for the reception, growth, and nourishment of the Fœtus.
- 303 Of a Pyriform shape, and situated between the Bladder and Rectum, and above the Vagina.
- 304 Upwards and forwards.
- 305 Downwards and backwards.
- 306 Somewhat flattened.
- 307 Convex.
- 308 About three inches in length, two in breadth at its upper part, one inch in thickness, and at the period of Puberty weighs from ten to twelve drachms.
- 309 From two to three ounces.
- 310 From three to four pounds.
- 311 Into a Fundus or upper part, a Neck or lower part, and a Body or intervening part.
- 312 The Fundus and Body.
- 313 Convex.
- 314 The Broad Ligaments.
- 315 The Fallopian Tube, the Round Ligament, and, behind these, the Ovary and its Ligament.
- 316 Rounded, and about half-an-inch in length.
- 317 The Os Uteri vel Os Tincæ.
- 318 By two Labia.
- 319 The posterior Labium.
- 320 Triangular, with its base directed upwards.
- 321 Two minute Foramina, which lead to the Fallopian Tubes.
- 322 Downwards.
- 323 The internal Cavity of the Cervix by a narrow circular part, called the Isthmus Uteri (vel Os Uteri Internum).
- 324 Two or three longitudinal Folds, to which other oblique Folds or Ridges converge, presenting the idea of branches from the stem of a tree, hence called Arbor Vitæ Uterina.
- 325 The Ovula of Naboth.
- 326 Three: two at the upper angles of the Cavity (one on either side), and one at its Cervix.
- 327 The Fallopian Tubes.
- 328 Very minute, scarcely admitting a bristle.
- 329 The Vagina.
- 330 Orificium Uteri Externum.

- 331 Externally, of Peritoneum; internally, of Mucous Membrane; and, between the two, a Muscular Coat intermixed with Elastic Tissue and Blood-vessels.
- 332 The Broad Ligaments of the Uterus, which attach this Viscus to the Abdominal Wall and Pelvis.
- 333 The anterior Ligament of the Uterus.
- 334 The Pelvis into two parts, an anterior and a posterior.
- 335 The Bladder, Urethra, and Vagina.
- 336 Upper part of the Rectum, and a portion of the small Intestines.
- 337 The middle or Muscular Coat.
- 338 Three: an external, internal, and middle.
- 339 In the impregnated state, particularly at the full period of Utero-gestation, or when the organ is enlarged from other causes, *e.g.* a Tumour.
- 340 Transversely, except at the Fundus and sides, where they are oblique.
- 341 Circularly, and form cones around the Openings of the Fallopian Tubes, and from thence spread out until they meet on the middle of the organ.
- 342 They are more indistinct and irregular in their course.
- 343 This Coat lines the interior of the organ, and is continuous below with the Mucous Lining of the Vagina, and above with that of the Fallopian Tubes.
- 344 Several Mucous Follicles or Glands (tubular) scattered over the surface, but most numerous in the Cervix, between the Rugæ.
- 345 Two firm cord-like Fasciculi of Fibres (one on either side) attached to the angle or upper part of the Uterus, just before the Fallopian Tubes.
- 346 Each between four and five inches in length, and formed of unstriated Muscular Fibres of the Uterus, from which they are derived together with Cellular Tissue and Blood-vessels.
- 347 Each partly in the Broad Ligament, and partly in the Inguinal Canal.
- 348 From the angles of the Uterus they pass upwards and outwards to the internal Inguinal Canals, through which they pass to the anterior part of the Symphysis Pubis, where the Fibres expand and terminate in the substance of the Labia and Mons Veneris.
- 349 From the Uterine and Ovarian Branches which are large and tortuous, the former derived from the internal Iliac and the Ovarian (which correspond to

- the Spermatic of the Male) from the front of the Aorta, just below the superior Mesenteric.
- 350 Into the Uterine Plexuses.
- 351 They are very large, and in the impregnated state of the organ are called Sinuses, consisting, within its substance, of Canals, and lined only by the internal Membrane of the Veins.
- 352 From the Sympathetic System (the Hypogastric and Spermatic Plexuses), and from the Sacral Plexus by an interlacement of its Visceral Nerves with the Branches of the Hypogastric Plexus.
- FALLOPIAN TUBES.
- 353 Two small worm-like Tubes, which convey the Ova from the Ovaria to the Uterus, and called by some the Excretory Ducts of the Ovaria.
- 354 Each is situated in the upper border of the Broad Ligament (Ligamentum Latum), extending from the upper angle of the Uterus to the lateral part of the Pelvis, where it terminates in a broad and free extremity, which is divided into a number of irregular Processes or Fringes (Fimbriæ), like the mouth of a Trumpet.
- 355 No; one of these Processes is longer than the rest, and it is to this Process that the corresponding Ovarium is attached.
- 356 It is supposed to guide or direct the Tube to the Ovarium, so that its expanded Fimbriated extremity shall embrace the surface of the Ovary when under the influence of impregnation.
- 357 A Fissure or Groove (Ostium Abdominale) into which the impregnated Ovum is received and conducted to the Orifice of the Fallopian Tube.
- 358 About four inches in length, and somewhat irregular in its course.
- 359 No; its Aperture into the Uterus (Ostium Uterinum) is the smallest part, and increases towards its outer extremity.
- 360 Similar to that of the Uterus, it is composed of a Muscular Coat, a Mucous Coat, and an external or Peritoneal Investment.
- 361 Longitudinally and circularly.
- 362 The longitudinal, but both Layers of Fibres are continuous with those of the Uterus.
- 363 Longitudinal Folds or Rugæ.

- 364 At its inner extremity it is continuous with that of the Uterus, and at the opposite or outer extremity with that of the Peritoneum.
- 365 Like the Uterus, a thin Cuticular Layer of Epithelium.
- 366 From those which supply the Uterus and Ovary.

OVARIES.

- 367 Two oblong flattened bodies in which the rudiments of the Fœtus are formed.
- 368 Within the Broad Ligaments of the Uterus,—their posterior aspect.
- 369 Of a whitish colour, and about a quarter-of-an-ounce in weight; their size varies, but in the virgin condition of the organ each is about one-a-half-inch in length, three-quarters of an inch wide, and a third in thickness.
- 370 By its anterior margin, where the Vessels pass.
- 371 To one of the Fimbriæ (its lengthened process) at the outer extremity of the Fallopian Tube.
- 372 To the upper angles of the Uterus on either side, by means of a round Fibrous Cord, which is derived from the Muscular Fibres of the organ, and called the Ligament of the Ovary.
- 373 It is composed of a Fibro-vascular Parenchyma or Stroma enclosed within a Fibrous Capsule, which consists of three Layers—an internal or Vascular, a middle or Fibrous, and an external or Peritoneal Coat.
- 374 Yes; except at the attached margin where the Vessels enter.
- 375 Firm, thick, of a whitish colour (hence called Tunica Albuginea), and very adherent to the Parenchymatous Structure within.
- 376 A yellow spot or Fibrous Cicatrix is sometimes met with in some virgin Ovaries, which is nothing more nor less than a false Corpus Luteum.
- 377 After conception a yellow spot is found in one or both Ovaries, this is the true Corpus Luteum; it is a yellow globular substance, which is produced after the Ovum has escaped from the Ovisac, and as soon as the surface (previously occupied by the Ovum) has closed, it presents the appearance of a Cicatrix.
- 378 Small rounded transparent bodies, commonly called Graafian Vesicles, situated in the Cells of the Stroma.
- 379 In Females who have not had children, they vary from eight to twenty in number, they also vary in size from a pin's head to that of a pea.

- 380 Sometimes, especially those situated near the circumference of the organ.
- 281 They consist of a thin Coat filled with a transparent Fluid.
- 382 The Ovi-capsule (Tunica Fibrosa).
- 383 Yes, with a Layer of Nucleated Cells—the Membrana Granulosa of Baer.
- 384 The minute Vesicular Ovum.
- 385 From the Ovarian Arteries (which correspond to the Spermatic in the Male).
- 386 Into the Ovarian Plexus which inosculates with the Uterine and Vaginal Plexuses.
- 387 From the Sympathetic (its Spermatic Plexus).

SECTION XXVI.—ORGANS OF SENSE.

- 1 The Organs of Sense are parts so formed as to receive impressions from all external objects.
- 2 The Sense of Sight (the Eyes), Sense of Smell (the Nose), Sense of Hearing (the Ears), Sense of Taste (Mouth and Tongue), and Sense of Feeling (the Skin).

ORGAN OF VISION.

- 3 The Eyeballs.
- 4 In the Orbits; each surrounded by Muscles, which move them in various directions, and supported on a mass of Fat.
- 5 Two conical or funnel-like Cavities, whose bases are directed forwards and outwards, and their apices backwards and inwards.
- 6 In the upper part of the Face; on either side the Nose, and just below the Os Frontis.
- 7 Parts of seven Bones.
- 8 The Frontal, Sphenoid, Malar, Superior Maxillary, Palate, Lachrymal, and Ethmoid.
- 9 Above, by the Orbital Plate of the Frontal Bone and part of the lesser Wing of the Sphenoid; below, by part of the Malar Bone and the Orbital Processes of the Superior Maxillary and Palate Bones; on the inner side, by the Lachrymal Bone, the Os Planum of the Ethmoid Bone, and part of the body of the Sphenoid; and, on the outer side, by the Orbital Process of the Malar Bone and greater Wing of the Sphenoid.
- 10 Nine.

- 11 The Optic, the Sphenoidal and Spheno-maxillary Fissures, the Infra and Supra Orbital Foramina, the Temporo-malar Foramina, the anterior and posterior Ethmoidal Foramina, and the Opening of the Nasal Duct.
- 12 The Eyeballs, Lachrymal Glands, Muscles, Nerves, Blood-vessels, and Adipose Tissue.

EYEBALLS.

- 13 Almost Spherical.
- 14 Into two parts, an anterior and a posterior, the latter forming four-fifths of the Globe, and the anterior the remaining fifth.
- 15 The transparent portion (Cornea).
- 16 The opaque portion.
- 17 Three: they are, commencing externally, the Sclerotic with the Cornea; the second or Vascular Coat is the Choroid, with the Iris, Ciliary Ligament, and Muscle; the most internal is the Retina, with the Zonula Ciliaris.

TUNICA SCLEROTICA.

- 18 The Sclerotic with the Cornea complete the external Tunic of the Eyeball, and gives to it, from its density, its peculiar form.
- 19 The Optic Nerve.
- 20 Its posterior part, a little to its inner side.
- 21 From the entrance of the Optic Nerve, with whose Sheath it is continuous, to the Margin of the Cornea.
- 22 The Apertures for the transmission of the Nutrient Vessels.
- 23 Transversely, about half-an-inch.
- 24 Convex and smooth, except where the Muscles are attached to it.
- 25 Concave, and of a dark colour, and in apposition with the middle Tunic of the Eyeball (the Choroid).
- 26 The posterior part; and becomes thinner and whiter as it approaches the Cornea, hence the common expression applied to it—the White of the Eye.
- 27 It consists of an interlacement of Fibrous and yellow elastic Tissues.
- 28 Their presence in it is doubtful.
- 29 A thin Cribriform Lamella or Plate, which is perforated by minute openings for the passage of the Nervous Filaments.
- 30 No; there is one larger than the rest called Porus Opticus.

- 31 In the centre of this Cribriform Lamella, and transmits the Arteria Centralis Retinæ to the Eye.

CORNEA.

- 32 The firm transparent Layer which forms the anterior fifth of the Eyeball.
- 33 Convex, and in contact with the Conjunctiva.
- 34 Concave, and in contact with the Aqueous Humour.
- 35 It is received by its margin within the bevelled border of the Sclerotica, like a watch-glass fixed within the edge of its case.
- 36 Its transversediameter, about the one-fifteenth of an inch.
- 37 The Sclerotic Tunic.
- 38 It transmits the rays of light into the organ.
- 39 It becomes flaccid and opaque from infiltration of the Aqueous Fluid.
- 40 It consists of a series of concentric Laminæ—an outer one, which is strong and thick, called the Cornea Proper; another within, which is elastic, called the Cornea Elastica; and another still finer elastic Membrane, covered by an Epithelium.
- 41 The Conjunctiva.
- 42 The two elastic structures, which are named the Membrane of Demours.
- 43 A series of Layers, between fifty and sixty in number, which are fibrous and render the structure firm and tough.
- 44 In the healthy state of the Membrane they do not, but cease at its circumference.
- 45 It is well supplied with Nerves.

THE CHOROID (TUNICA VASCULOSA).

- 46 The most Vascular Coat of the Eye, consisting principally of Blood-vessels and Pigment Cells.
- 47 A rich chocolate-brown.
- 48 A deep black.
- 49 Between the Sclerotica and Retina, extending from the entrance of the Optic Nerve to the Ciliary Ligament.
- 50 A Foramen for the transmission of the Optic Nerve.
- 51 Three: an external, a middle, and an internal Layer.
- 52 Arteries and Veins, chiefly Veins, which pursue a contorted or flexuous course, hence called Venæ Vorticoseæ.
- 53 The ramifications of the minute Arteries, which secrete the Pigmentum Nigrum.
- 54 The Pigmentary Membrane (Choroidal Epithelium), which presents on its surface hexagonal Cells with

Granular contents (containing the Granules of the Pigmentum Nigrum) which are so disposed as to resemble a mosaic appearance.

- 55 The external Layer.
- 56 The middle or Arterial Layer (Tunica Ruyschiana) which is reflected inwards at its junction with the Ciliary Ligament.
- 57 A Professor of Anatomy at Amsterdam in 1665, who, previous to his death (*æt.* 93), came to the conclusion that the Body was entirely made up of Vessels.
- 58 No; but replaced by a Layer of Fibrous Tissue of the Choroid of metallic brilliancy, called the Tapetum.
- 59 No; its absence gives the red colour to the Iris & Pupil.
- 60 To absorb the superabundant rays of light entering the Globe of the Eye.
- 61 These Processes or Folds are formed by the reflection of the anterior margins of the middle Coat of the Choroid, which is drawn up as it were into a series of delicate Folds or Plaits, whose aggregate forms a complete circle around the Lens, hence called by Anatomists Corpus Ciliare vel Corona Ciliaris.
- 62 About four score.
- 63 Triangular.
- 64 The Ciliary Ligament.
- 65 It is free, and rests against the circumference of the Lens.
- 66 With a Layer of Pigmentum Nigrum.
- 67 Of a whitish colour.
- 68 No, they vary, consisting of larger and smaller Folds.
- 69 The Suspensory Ligament of the Lens on the front of the Vitreous Humour.
- 70 Into Grooves or Hollows between the Folds on the anterior aspect of the Hyaloid Membrane of the Vitreous Humour.
- 71 The narrow whitish circle (Annulus Albidus) which is attached to the inner surface of the Sclerotic at its junction with the Cornea.
- 72 The bond of union between the external and middle Coats of the Eye.
- 73 The Choroid Coat.
- 74 The Iris.
- 75 The Ciliary Vessels and Nerves.
- 76 A minute Groove.
- 77 A minute Canal, called the Ciliary Canal or Canal of Fontana.

- 78 An Anatomist of Tuscany, who discovered the Canal which is called after him in 1778.
- 79 This Muscle, which is composed of Unstriated Fibres, is situated on the surface of the Choroid Coat, close to the Ciliary Ligament.
- 80 In front of the Sclerotic Coat, and its Fibres passing backwards and inwards terminate on the Choroid Coat.
- 81 The Nerves of the Iris.

IRIS.

- 82 The circular Membrane which forms an imperfect Septum between the anterior & posterior Chambers of the Eye.
- 83 A circular Opening for the transmission of the rays of light, called the Pupil.
- 84 No; it is placed somewhat nearer its Nasal side.
- 85 The posterior elastic Layer of the Cornea and the Ciliary Ligament.
- 86 The margin of the Pupil.
- 87 Both Vascular and Muscular, which latter consists of radiating and circular Fibres.
- 88 The anterior, whose Fibres converge towards the centre, and produce dilatation of the Pupil.
- 89 They surround the Pupil like a Sphincter, and, by their action, produce contraction of the Pupil.
- 90 This surface is covered with a Layer of Pigment, which, from its resemblance in colour to a ripe grape, has had the name of Uvea applied to it.
- 91 Towards the Cornea.
- 92 Towards the Lens and Ciliary Processes.
- 93 About one-thirtieth of an inch wide.
- 94 By the contraction of the radiating Fibres.
- 95 By the contraction of the circular Fibres.
- 96 In its substance they are ramified and very irregular as in the Choroid; on the anterior part they are ramified and somewhat oval; on the posterior part (the Uvea Iridis) the Cells are rounded and filled with Granules.
- 97 The colour and position of the Pigment.
- 98 Membrana Pupillaris.
- 99 Chiefly from the long and anterior Ciliary Branches, which arise from the Ophthalmic Artery.
- 100 To the Venæ Vorticose of the Choroid, and end in the Ophthalmic Vein.
- 101 From the Ciliary Branches of the Nasal Nerve and the Lenticular Ganglion.

- 102 Their terminations have hitherto eluded the researches of the Anatomist.
- 103 They (two in number, one on either side the Eyeball,) form, by inoculation, an Arterial Circle around the circumference of the Iris (formerly called *Zona Major*), and from this Loop or Circle Branches are given off which pass to the Pupil, forming a second Arterial Circle (formerly called *Zona Minor*) around its Pupillary Margin.

RETINA.

- 104 The third or inner Tunic of the Eye.
- 105 Between the Choroid Coat and Vitreous Humour.
- 106 It commences at the termination of the Optic Nerve (of which it is an expansion) and ends near to the Ciliary Ligament at the point where the Choroid Coat is reflected to form the Folds of the Ciliary Processes.
- 107 Three: an external, middle, and an internal Layer.
- 108 Jacob's Membrane.
- 109 It is very thin, and presents a Flocculent appearance when the Eye is immersed in water, and composed (as shown by the aid of a microscope) to consist of minute Granules having a tessellated appearance.
- 110 This Layer, which is semitransparent and of a bluish white colour, is formed by the expansion of the Optic Nerve, and consists of an immense number of minute rounded Granules, which are collected into two sets, with an intervening portion of a Striated appearance.
- 111 The minute Fibres of Müller.
- 112 This Layer forms a Plexus of Blood-vessels being the ramifications of the *Arteria Centralis Retinæ*.
- 113 Through the Optic Nerve, through the *Porus Opticus* in the centre of the *Cribriform Lamella*.
- 114 A circular spot in the centre of the posterior part of the Retina (*Fovea Centralis vel Foramen Centrale*).
- 115 *Limbus Luteus* (of *Soemmerring*).
- 116 The internal and external Layers of the Retina.

ZONULA CILIARIS.

- 117 The thin Vascular Layer which connects the anterior margin of the Retina with the anterior surface of the Lens Capsule, near to its circumference.
- 118 The Suspensory Ligament of the Lens.
- 119 A number of small Plaits or Folds, which resemble the Ciliary Processes of the Choroid Coat, between which they are received.

- 120 In the form of rays around the Capsule.
 121 They are stained with the Pigmentum Nigrum, which is derived from the middle Coat of the Choroid.
 122 The Hyaloid Membrane of the Vitreous Humour.
 123 The Canal of Petit.
 124 Like the large Intestine it is Sacculated, presenting the appearance of a chain of minute Vesicles communicating freely with each other.

HUMOURS OF THE EYE.

- 125 The Aqueous, the Vitreous, & the Crystalline Humours.
 126 The thin pellucid Fluid situated in the anterior and posterior Chambers of the Eye.
 127 That space which intervenes between the Cornea anteriorly, and the Iris and Pupil posteriorly.
 128 That small space which intervenes between the Iris and Pupil anteriorly, and the Ciliary Processes, Suspensory Ligament and Lens posteriorly.
 129 Through the Pupil.
 130 A thin transparent Membrane which secretes this fluid.
 131 It transmits the rays of light—it also allows the free motions of the Iris.

VITREOUS HUMOUR.

- 132 A transparent jelly-like mass which occupies a large portion (four-fifths) of the Globe of the Eye.
 133 The Hyaloid Membrane.
 134 Numerous Processes or Septa, which form Cells, and within which this Fluid is contained.
 135 A Branch of the Arteria Centralis Retinæ.
 136 A Process or Tubular Sheath of the Membrane.
 137 The Lens and its Capsule.
 138 Being extra-vascular they receive their nutrient properties from the Vessels of the Retina and Ciliary Processes.

CRYSTALLINE LENS.

- 139 The Crystalline Lens is situated behind the Pupil, surrounded by the Ciliary Processes, and embedded in the Vitreous Humour.
 140 The Hyaloid Membrane.
 141 Aqua vel Liquor Morgagni.
 142 A transparent Layer of nucleated Cells.
 143 A solid and transparent doubly-convex body.
 144 The posterior.
 145 Somewhat rounded.

- 146 A series of Concentric Laminae, of which the most external are soft, the subjacent ones firmer, and the most internal or central are firm and form a hard nucleus.
- 147 After the Lens has been immersed in boiling water or been hardened in Alcohol, they become detached from each other more readily.
- 148 From side to side nearly half-an-inch, and from before backwards about a quarter-of-an-inch.
- 149 Three triangular Segments, whose bases are directed towards the circumference, and their edges towards the centre.
- 150 Minute parallel Fibres, which are connected by their extremities to the opposite surfaces of the Lens; thus the scalloped convexity on one border of the Lens fitting the concave scalloped border on the other.
- 151 The one five-thousandth of an inch in diameter.
- 152 The Capsule.
- 153 The Canal of Petit.
- 154 Anteriorly, by the plaited Folds of the Zonula Ciliaris or Suspensory Ligament; posteriorly, by the Hyaloid Membrane; and within, by the margin of the Lens.
- 155 No Vessels exist in its texture.
- 156 Almost spherical, and of a reddish colour.
- 157 Soft, and not perfectly translucent.
- 158 Firm and transparent.
- 159 Dense, and of a yellowish colour.
- 160 This affection may arise from an increase of the refractive power of the eye, or an elongation of its axis, as in over-convexity of the Cornea and Lens; so that in either case the rays of light are brought to a focus ere they reach the Nervous Membrane, or, in other words, they fall short of the Retina.
- 161 By the use of concave glasses, which tend to disperse the rays of light, and thus prevent their falling short of the Retina, *i.e.* coming to a focus so soon.
- 162 This affection may arise from various causes, as from a diminished quantity and density of the Humours of the Eye, or from a flattened condition of the Lens, thereby diminishing its refractive powers, the consequence is the rays of light are thrown beyond the Retina.
- 163 By the use of convex glasses, adapting their power to the precise demand of the Eye, and thus correcting the transmission of the rays.

APPENDAGES OF THE EYE.

- 164 The Conjunctiva, the Eyebrow, Eyelids, Eyelashes, and the Lachrymal Apparatus.

CONJUNCTIVA.

- 165 The Tunica Conjunctiva is the thin transparent Mucous Membrane of the Eye.
- 166 It covers the whole of the anterior surface of the Eye, and is then reflected upon the Lids, where it forms their internal Layer.
- 167 The superior and inferior Palpebral Sinuses.
- 168 That portion which covers the Cornea.
- 169 That portion which covers the Sclerotica and the inner surface of the Eyelids, particularly the latter.
- 170 The Gastro-pulmonary Mucous Membrane.
- 171 By lining the Puncta Lachrymalia, it forms a continuous surface with the Mucous Lining of the Lachrymal Passages and Nasal Ducts, which latter is continued into the Pharynx and Mouth, where it becomes the Gastro-pulmonary.
- 172 Yes, consisting of three or four Layers of flattened Scales.
- 173 A small red and fleshy-looking body situated at the inner Commissure of each Eyelid.
- 174 A group of Mucous Follicles embedded in a Fibro-cartilaginous Tissue.
- 175 A number of minute Hairs which may often be seen by the naked Eye.
- 176 It secretes a whitish Fluid, which may be frequently seen at the inner Canthus of the Eye.
- 177 A small Fold of the Conjunctiva, called Plica Semilunaris, which contains a minute Lamella of Cartilage.
- 178 The rudiment of the third Lid, the Membrana Nictitans of birds.

SUPERCILIUM OR EYEBROW.

- 179 The projecting Curve or Arch of Integument, which corresponds to the Superciliary Ridge or Orbital Arch of the Frontal Bone.
- 180 The subjacent Muscles, viz: the Orbicularis Palpebræ, Occipito-frontalis, and Corrugator Supercilii.
- 181 Long coarse hairs, which are directed outwards.
- 182 To protect the Eyes from a too powerful light, also from small particles or dust passing into them.

PALPEBRÆ OR EYELIDS.

- 183 Two semilunar Folds placed in front of each Eye.

- 184 The superior.
- 185 The Canthi.
- 186 The inner Canthus, from the circumstance of its being prolonged inwards towards the Nose; whilst the outer unites at an acute angle.
- 187 The Fissura Palpebrarum.
- 188 Lacus Lachrymalis.
- 189 The Lachrymal Papilla or Tubercle.
- 190 Punctum Lachrymale.
- 191 Integument, Orbicularis Palpebrarum, Tarsal Cartilages, Ciliary or Meibomian Glands and Conjunctiva.
- 192 This thin Plane of Elliptical Fibres is situated immediately under the skin of the Eyelids.
- 193 A thin Stratum of Fibrous Tissue, which is continued from the margin of the Orbit to join the free edge of the Tarsal Cartilage.
- 194 The Broad Tarsal Ligament.
- 195 No, it is free from Adipose Tissue.
- 196 Two thin Plates of Fibro-cartilage, situated one in each Eyelid.
- 197 About one inch in length; the superior is of a semi-lunar form, and the inferior straight.
- 198 The Tendon of the Levator Palpebræ.
- 199 By the Tendon of Orbicularis Palpebrarum (sometimes called Ligamentum Tarsi Internum).
- 200 By a Fibrous Lamella, the Ligamentum Tarsi Externum.
- 201 In Grooves on the inner or Ocular surfaces of the Tarsal Cartilages.
- 202 Parallel with each other.
- 203 About thirty in the upper Lid, and about twenty in the lower Lid.
- 204 At the posterior edge of the loose border.
- 205 It consists of a small Tube, closed at the bottom extremity (a Cul-de-sac) of a yellowish colour, lined by a scaly Epithelium, and contains a Sebaceous Secretion.
- 206 They consist of two or more rows of long thick Hairs, which are situated in the anterior edge of the loose border of the Eyelids.
- 207 Those of the upper Lid, diminishing from the centre as they proceed to either side.
- 208 Upwards.
- 209 Downwards.
- 210 From Branches derived from the first group of the

Ophthalmic Artery, viz: the Lachrymal and Palpebral Branches.

- 211 Into the Frontal and Angular Veins, which latter is formed by the union of the Frontal Vein with the Supra-orbital Vein.
- 212 From the Ophthalmic and Facial Nerves.
- 213 The Supra-trochlear and Supra-orbital Branches (which are derived from the Frontal Branch of the fifth), the Lachrymal, and the Infra-trochlear (which latter is derived from the Nasal Branch of the fifth).

LACHRYMAL APPARATUS.

- 214 The Lachrymal Gland with its Ducts—the Punctum Lachrymale, Lachrymal Canal, with the Lachrymal Sac and Nasal Duct.
- 215 In the depression on the inner side of the external Angular Process of the Os Frontis.
- 216 Into two parts: an Orbital and a Palpebral part.
- 217 Oval; about three-quarters of an inch in length; and situated in the Lachrymal Pit or Fossa in the Orbital Plate of the Os Frontis.
- 218 Periosteum, the Globe of the Eye, the superior and external Recti Muscles, and the Palpebral or Broad Tarsal Ligament.
- 219 In the upper Eyelid; it is a small piece which projects beneath the Lid.
- 220 A Covering of Fibrous Membrane.
- 221 In structure analogous to the Salivary Glands.
- 222 These Ducts, from eight to ten in number, open in a curved line on the inner surface of the upper Eyelid, near the outer Canthus.
- 223 Two small Orifices, one for each Eyelid, situated at the commencement of the Lachrymal Canals.
- 224 About a quarter-of-an-inch.
- 225 Two small Tubes which extend from the Puncta Lachrymalia to the Lachrymal Sac.
- 226 The superior Canal.
- 227 A little above its middle.
- 228 Sometimes by two distinct Orifices, and sometimes by a common Duct.
- 229 The upper extremity of the Nasal Duct.
- 230 In a Bony Groove or Depression below the inner Canthus of the Eye.
- 231 The Os Lachrymale vel Unguis and the Nasal Process of the Os Maxillare Superius.

- 232 A semilunar Valve.
- 233 A fibrous expansion or Aponeurosis derived from the Tendon of the Eyelids (Tendo-orbicularis); the Tensor Tarsi Muscle is also in relation with it externally.
- 234 From the Lachrymal Sac to the front of the inferior Meatus of the Nose, where it terminates by an oblique Orifice.
- 235 About three-quarters of an inch in length, and its direction downwards, backwards, and outwards.
- 236 Mucous Membrane, which is continuous above with the Conjunctiva, and below with the Schneiderian or Pituitary Membrane.
- 237 Fistula Lachrymalis.
- 238 From the Lachrymal Branch of the Ophthalmic Artery.
- 239 From the Ophthalmic and superior Maxillary Nerves (the Lachrymal and Orbital Branches.)
- 240 The Tears secreted by the Lachrymal Gland are conveyed by its Excretory Ducts over the anterior surface of the Eye, the Puncta Lachrymalia absorb them, and are directed by the Lachrymal Canals to the Lachrymal Sacs, from whence they pass through the Nasal Ducts into the Nose.

SECTION XXVII.—ORGAN OF SMELL.

- 1 The Nose.
- 2 Into two parts: the external prominent part or Nose, and the internal or Nasal Fossæ.
- 3 A triangular Pyramid, and situated just above the upper Lip.
- 4 By means of a narrow bridge.
- 5 Two Openings called the Nostrils.
- 6 A Septum called the Columna.
- 7 By a number of small Hairs (Vibrissæ) which pass transversely across the Openings.
- 8 Integument, Muscles, Bones, Fibro-cartilages, Mucous Membrane, with the Vessels, Nerves, and Hairs.
- 9 The Tip (Lobulus) and the Wings (Alæ) of the Nose.
- 10 A number of Sebaceous Glands, which secrete an oil-like Fluid.
- 11 Pyramidalis Nasi, Compressor Nasi, Levator Alæ Nasi, and Depressor Alæ Nasi.
- 12 Yes.
- 13 Five.

- 14 The middle one is the Septum Nasi; the two superior, lateral, and the two inferior Cartilages, which latter form the Tip and Arch of the anterior Nares.
- 15 Triangular, and situated vertically, and being connected above with the Nasal Bones and Lateral Cartilages; below, with the Palate Processes of the superior Maxillary Bones; and behind, with the Vomer and Ethmoidal Septum.
- 16 No.
- 17 The Vomer and Ethmoid.
- 18 Triangular; and attached above with the Nasal Bones; below, with the inferior Cartilages; anteriorly, with the Cartilages of the Septum; and posteriorly, with the ascending or Nasal Processes of the superior Maxillary Bones.
- 19 Arched; and attached above with the lateral Cartilages; anteriorly with the Cartilage of the Septum; and to the outer side, indirectly with the superior Maxillary Bones.
- 20 By two or three small Cartilaginous Plaits as Appendages, and called Cartilagine Minores vel Sesamoideæ.
- 21 From Branches of the Facial and Ophthalmic Arteries (the Lateralis Nasi and Nasal Branches).
- 22 Yes; a small Branch derived from the Coronary Arch of the Facial in the upper Lip, and called the Artery of the Septum.
- 23 From the Facial, the Infra-orbital, and the Nasal Branch of the fifth.

NASAL FOSSÆ.

- 24 Two irregular Cavities, which extend from the Nose anteriorly, to the Pharynx posteriorly.
- 25 Their boundaries have been described.
- 26 The spongy or Turbinate Bones.
- 27 The two superior.
- 28 It is a separate Bone, and called the inferior spongy Bone.
- 29 Meatuses.
- 30 The superior, middle, and inferior Meatus.
- 31 The superior one is between the superior and middle Spongy Bones; the middle one, between the middle and inferior Spongy Bones; and the inferior one between the inferior Spongy Bone and the Floor of its corresponding Fossa.
- 32 From before backwards.

- 33 The superior Meatus.
- 34 The Sphenoidal and posterior Ethmoidal Cells.
- 35 The Spheno-palatine Foramen through which the Vessels and Nerves enter the Nose.
- 36 The anterior Ethmoidal Cells and Frontal Sinus, and near its middle, an oblique aperture which leads into the Antrum Maxillare.
- 37 The Ductus ad Nasem.
- 38 The anterior Palatine Foramen.
- 39 Into the Meatuses.
- 40 The Pituitary or Schneiderian Membrane.
- 41 Externally, with the Skin or common Integument, and internally with the Gastro-pulmonary Mucous Membrane, through the Meatuses of the Nose, with the Sphenoidal, Ethmoidal, Frontal, and Maxillary Sinuses; through the Ductus ad Nasem, with the Conjunctiva of the Eye; through the Eustachian Tube, with the Tympanum and Mastoid Cells; and, lastly, through the Pharynx and Mouth into the Lungs and Alimentary Canal (the Gastro-pulmonary).
- 42 From the Ophthalmic and internal Maxillary Arteries, viz: the anterior and posterior Ethmoidal Branches, derived from the former, and the Spheno-palatine and Pterygo-palatine Branches from the Pterygo-maxillary portion derived from the latter.
- 43 From the Olfactory, the Nasal Branch of the fifth, and from one of the Cranial Ganglia, Meckel's Ganglion.

SECTION XXVIII.—ORGAN OF HEARING.

- 1 The Ear.
- 2 The Temporal Bone.
- 3 According to some Anatomists, into two parts; according to others, into three parts.
- 4 The external Ear, the Tympanum or middle Ear, and the Labyrinth or internal Ear.
- 5 The Pinna or Auricle, & the Meatus Auditorius Externus.
- 6 Somewhat oval, with its largest end directed upwards.
- 7 Four eminences and three depressions.
- 8 The Helix (*Helix*, a fold.)
- 9 The Anti-helix (*anti*, opposite.)
- 10 Tragus (*tragos*, a goat.)
- 11 The Anti-tragus.
- 12 By a soft, pendulous part, called the Lobule.
- 13 The Fossa Innominata or Fossa of the Helix.

- 14 The Navicular or Scaphoid Fossa, or the Fossa of the Anti-helix.
 - 15 The Concha.
 - 16 The common Integument, Cartilage, Ligaments, and Muscles.
 - 17 The common Integument.
 - 18 Analogous to the Pinna itself.
 - 19 Four Fissures.
 - 20 An elongated Process—the Processus Caudatus.
 - 21 One on the anterior part of the Helix; one between the terminations of the Helix and Anti-helix; and two at the under part of the commencement of the Meatus, these last are sometimes called the Fissures of Santorinus.
 - 22 Three: one connects the Tragus with the Root of the Zygoma; another connects the Convexity of the Concha to the Mastoid Process of the Temporal Bone; and the third connects the Temporal Aponeurosis with the upper part of the Concha.
 - 23 Attollens Aurem, Attrahens Aurem, and Retrahens Aurem.
 - 24 The Attollens Aurem.
 - 25 The Attollens Aurem is triangular and arises from the Tendon of the Occipito-frontalis Muscle; it is inserted into the upper part of the Concha.
 - 26 To elevate the Ear.
 - 27 The Attrahens Aurem is triangular, and arises from the fore part of the Aponeurosis of the Occipito-frontalis Muscle, and is inserted into the projection on the anterior border of the Helix.
 - 28 To draw or pull the Ear forward.
 - 29 The anterior and posterior Temporal Arteries.
 - 30 The Retrahens Aurem arises by three or four roundish Muscular Slips from the Root of the Mastoid Process of the Temporal Bone, and is inserted by Aponeurotic Fibres into the posterior surface of the Concha.
 - 31 To draw or pull the Ear backward.
 - 32 The posterior Auricular Artery and Nerve.
 - 33 Five Muscles: Helicis Major, Helicis Minor, Tragicus, Anti-tragicus, and Transversus Auriculæ.
 - 34 To the external Ear, and considered as rudimentary and not always present.
- MEATUS AUDITORIUS EXTERNUS.
- 35 The Canal which extends from the Pinna (the bottom of its Concha) to the Membrane of the Tympanum.

- 36 Inwards, forwards, and upwards, and alighty curved, its Concavity looking downwards.
- 37 About one inch in length : and its form, that of an oval Cylinder.
- 38 The middle portion.
- 39 It is partly Cartilaginous (from the Pinna), and partly Osseous.
- 40 In the Adult, the Osseous portion ; in the Fœtus, the Meatus is entirely Cartilaginous.
- 41 By a continuation of the Integuments of the Concha.
- 42 Some short Hairs, which extend across the Tube.
- 43 The Ceruminous Follicles.
- 44 To secrete the Cerumen or Wax, which is discharged through small Excretory Ducts into the Meatus.
- 45 From Branches derived from the Temporal and external Carotid, viz : the anterior and posterior Auricular.
- 46 From the Auriculo-temporal Branch of the fifth (its inferior Maxillary division), and from the Cervical Plexus ; the Auricularis Magnus Branch.

TYMPANUM OR MIDDLE EAR.

- 47 An irregular Osseous Cavity situated in the substance of the Temporal Bone—its Petrous portion.
- 48 The Membrana Tympani.
- 49 An Osseous Groove around the circumference of the Auditory Passage, near its termination.
- 50 Oval, with its long diameter nearly vertical.
- 51 Concave.
- 52 Convex.
- 53 Three Lamellæ : an external or Cuticular Stratum, a middle or Fibro-elastic Stratum, and an internal or Mucous Layer.
- 54 The Handle of the Malleus.
- 55 Externally, by the Meatus Externus and Membrana Tympani ; internally by the Labyrinth ; posteriorly, by the Mastoid Cells ; and anteriorly, by the Eustachian Tube.
- 56 An Osseous Projection situated in the inner boundary or Wall of the Tympanum, about its centre.
- 57 By the Projection of the first turn of the Cochlea.
- 58 Three or four small Depressions which transmit the Tympanic Branches of the Glosso-pharyngeal nerve, (Jacobson's Nerve.)
- 59 The Bones in the Tympanum.
- 60 Three : Malleus, Incus, and Stapes.

- 61 A prolongation of the Incus.
- 62 The Malleus.
- 63 Into a Head, Neck, Handle, and two Processes.
- 64 Convex.
- 65 With the Incus, by means of a small Depression at the back of the Malleus.
- 66 Between the Head and Processes.
- 67 An elongated Process which terminates in a small rounded Process, (Processus Brevis.)
- 68 The Membrana Tympani.
- 69 A thin flattened piece of Bone which extends from the Neck to a Groove near the Glasserian Fissure.
- 70 The Laxator Tympani.
- 71 Vertical, with the Head upwards.
- 72 A little behind and to the inner side of the Malleus.
- 73 Into a Body and two Processes.
- 74 The Body.
- 75 No.
- 76 The Aperture of the Mastoid Cells.
- 77 It ends in a rounded Process or Nodule called the Os Orbiculare.
- 78 The Head of the Stapes.
- 79 With the long Process vertical, and the short Process horizontal.
- 80 This Bone is placed horizontally extending from the extremity of the long Process of the Incus to the Fenestra Ovalis.
- 81 The Stapes: because if this Bone falls from its natural position the Perilymph escapes and deafness is the result.
- 82 Into a Base, Head, Neck, and two Crura or Processes.
- 83 Like that of the Fenestra Ovalis on which it rests, being convex on its upper border, and almost flat at its lower border.
- 84 A small Depression, which receives the Orbicular or long Process of the Incus.
- 85 The constricted part below the Head.
- 86 The Stapedius.
- 87 From the Base to the Neck.
- 88 No; the anterior is the shortest.
- 89 A Groove.
- 90 At the Neck.
- 91 Forwards and backwards.
- 92 A very thin Membrane.

- 93 It is attached to the Groove.
- 94 By articular Ligaments.
- 95 By three special Ligaments: thus one extends from the Head of the Malleus to the Roof or upper Wall of the Tympanum; another serves to connect the short Process of the Incus to the posterior part of the containing Cavity, viz: the Aperture of the Mastoid Cells; and the other or third Ligament (which is Orbicular or Circular) serves to connect the base of the Stapes with the circumference or margin of the Fenestra Ovalis.
- 96 Yes, by Mr. Tod, who calls them Superior Capitis Mallei, Obliquus Incudis Externus Posterior, et Musculus-Stapedius Inferior.
- 97 Tensor Tympani, Laxator Tympani, and Stapedius.
- 98 The Tensor Tympani (Musculus Internus Mallei).
- 99 This Muscle is contained in a bony Canal in the Petrous Bone, and arises from the surface of this Canal and from a small portion of the Eustachian Tube; and is inserted into the inner border of the Handle of the Malleus, just below the commencement of its long Process.
- 100 This Muscle arises from the Spinous Process of the Sphenoid Bone, and, passing through the Glenoidal or Glasserian Fissure, is inserted into the Neck of the Malleus, just above its long Process.
- 101 This Muscle arises from the circumference or margin of the Canal lodged in the interior of the Pyramid on the posterior side of the Tympanum; and is inserted into the posterior part of the Neck of the Stapes.
- 102 Ten: five large and five small.
- 103 The Meatus Auditorius Externus, Fenestra Ovalis, Fenestra Rotunda, Mastoid Cells, & Eustachian Tube.
- 104 At the upper part of the inner Wall of the Tympanum.
- 105 Its long diameter is directed horizontally, with its convex borders upwards.
- 106 The communication between the Tympanum & Vestibule.
- 107 The base of the Stapes.
- 108 This somewhat triangular Opening is situated in the inner Wall of the Tympanum, a little below the Fenestra Ovalis.
- 109 The small rounded eminence or projection called the Promontory.
- 110 The communication between the Tympanum & Cochlea.

- 111 A delicate Membrane, the secondary Membrane of the Tympanum.
- 112 At the posterior and inner part of the Tympanum by one large Aperture.
- 113 Air.
- 114 A channel of communication between the Cavity of the Tympanum and the Fauces.
- 115 About one inch-and-a-half in length, and its direction downwards and inwards to the Pharynx.
- 116 Like the Meatus Auditorius Externus it is partly Cartilaginous and partly Osseous.
- 117 The Pharyngeal extremity.
- 118 That towards the Tympanum.
- 119 Somewhat more than half-an-inch.
- 120 About one inch in length.
- 121 From the Temporal Bone to the interior of the Pharynx.
- 122 With Mucous Membrane, which is continuous with that of the Tympanum, and also with that of the Pharynx.
- 123 It is composed of three Layers, an external or Mucous Layer, which is derived from the Mucous Lining of the Tympanum; a middle or Fibrous Layer; and an internal or Serous Layer, which latter is continuous with that of the Cochlea.
- 124 A Ciliated Layer of Epithelium.
- 125 The entrance and exit of the Chorda Tympani Nerve, the Openings of the Tensor Tympani, Laxator Tympani, and Stapedius.
- 126 At about the middle of the posterior Wall.
- 127 By a special Aperture in the anterior Wall of the Tympanum, internal to the Glasserian Fissure.
- 128 In the inner Wall of the Tympanum, just above that of the Eustachian Tube.
- 129 In the Glasserian Fissure, which is situated in the anterior Wall of the Tympanum.
- 130 In the Pyramid of the Tympanum.
- 131 A triangular Osseous Process.
- 132 In the posterior Wall of the Tympanum, a little below the large Aperture which leads into the Mastoid Cells.
- 133 A minute Opening.
- 134 The Stapedius Muscle, as already stated.
- 135 The Ridge of the Aqueduct of Fallopius.
- 136 From Branches derived from the external Carotid Artery, viz: the internal Maxillary, posterior Auricular, and Ascending Pharyngeal, called the Tympanic, Auricular, and Pharyngeal Branches.

- 137 Yes, whilst that Vessel is within the Temporal Bone.
- 138 Into the Meningeal and Pharyngeal Trunks, from thence to the internal Jugular Vein.
- 139 From several sources; its lining Membrane is supplied from the Tympanic Plexus, which is formed by the Tympanic Branch of the Glosso-pharyngeal (or Jacobson's Nerve) with the Sympathetic Nerve; and the Muscles are supplied from the following sources, viz: the Tensor Tympani is supplied with a Filament from one of the Cranial Ganglia, called the Otic or Arnold's Ganglion; the Stapedius is supplied with Branches from the Facial; and the Laxator Tympani is supplied from a Branch of the Facial, viz. the Chorda Tympani Nerve.
- 140 The Chorda Tympani.

LABYRINTH OR INTERNAL EAR.

- 141 In the Petrous portion of the Temporal Bone, between the Tympanum and the Meatus Auditorius Internus.
- 142 Two portions: a Membranous and an Osseous portion (the latter enclosing the former).
- 143 Into three parts, viz: the Vestibule, the semicircular Canals, and the Cochlea.
- 144 The triangular or oval Cavity of the Labyrinth.
- 145 Immediately within the inner Wall of the Tympanum.
- 146 Anteriorly, the Cochlea; and posteriorly, the Semicircular Canals, *i.e.* the Vestibule occupies the middle of the Labyrinth.
- 147 Fenestra Ovalis, Scala Vestibuli, and the five Openings of the three semi-circular Canals.
- 148 The Opening of communication between the Tympanum and Vestibule, on its external Wall, as already adverted to in the description of the Tympanum.
- 149 The oval Aperture which leads into the Cochlea at the anterior and lower part of the Vestibule.
- 150 Three very small Osseous Tubes, which communicate with the Vestibule at both extremities.
- 151 According to their position, into superior vertical (Canalis Semicircularis Verticalis Superior), middle or posterior vertical (Canalis Semicircularis Verticalis Posterior), and an inferior or horizontal Canal (Canalis Semicircularis Horizontalis).
- 152 Ampulla.
- 153 This Canal crosses the upper border of the Petrous Bone at right angles, and stands out or projects on

the anterior surface of this portion of the Temporal Bone.

- 154 At the outer Orifice.
 155 The middle or posterior vertical Canal.
 156 This Canal runs parallel with the posterior surface of the Petrous Bone, and forms a little Projection immediately above the Aqueduct of the Vestibule.
 157 At the lower Orifice.
 158 The horizontal Canal.
 159 In the substance of the Petrous Bone, nearly on a level with the Fenestra Ovalis.
 160 At the outer Orifice.
 161 Only five Openings.
 162 From the circumstance of the narrow extremity of the superior vertical Canal forming, with the upper extremity of the posterior vertical Canal, only one common Opening.
 163 The Aqueduct of the Vestibule, and the small Openings of the Vessels and Filaments of the Auditory Nerve.
 164 A small slit-like Opening (situated behind the Meatus Internus) which leads into the Vestibule.
 165 A small Vein; it also admits a small Process of Membrane, which is continuous internally with the lining Membrane of the Vestibule, and externally with the Dura Mater.

COCHLEA.

- 166 Immediately before the Vestibule.
 167 Pyramidal; with its base directed towards the Meatus Auditorius Internus, and its apex towards the upper and anterior part of the inner Wall of the Tympanum opposite the Canal for the Tensor Tympani.
 168 Nearly three Coils.
 169 Left to right.
 170 Right to left.
 171 About one inch-and-a-half.
 172 In a closed extremity, called the Cupola.
 173 The first.
 174 The Promontory on the inner Wall of the Tympanum.
 175 Into two Passages (Scalæ) by means of a thin Lamina or Septum of Bone, which, by being prolonged by a Membrane to the opposite Wall of the Cochlea, constitutes a complete Septum (Lamina Spiralis).
 176 Osseous and Membranous; the former consists of two thin Osseous Laminae, which are porous, transmitting

- Filaments of the Cochlear Nerve to the Membrane of the Cochlea.
- 177 The Hamulus.
- 178 The two passages into which the Canal of the Cochlea is divided by its Septum.
- 179 The Scala Vestibuli.
- 180 One into the front of the Vestibule (Scala Vestibuli), and the other (Scala Tympani) opens into the Tympanum through the medium of the Fenestra Rotunda vel Fenestra Cochleæ.
- 181 Over the Hamulus, by an Aperture common to both, called by Breschet "Helico-trema."
- 182 This minute Opening is situated near the commencement of the Scala Tympani, and terminates at the posterior part of the Petrous Bone, and gives passage to a small Vein.
- 183 From the edge of the Lamina Spiralis to the Groove in the opposite Wall of the Tube of the Cochlea, and continued upwards to the Hamulus.
- 184 Zona Mollis.
- 185 The Bony substance or central axis, around which the Spiral Tube coils.
- 186 Conical; with its base at the bottom of the Meatus Auditorius Internus, whilst its apex, which does not extend beyond the second Coil of the Cochlea, is bent and expanded after the manner of a funnel—hence called Infundibulum.
- 187 To the last half-turn for the transmission of Vessels and Nerves.
- 188 No; the central one is the largest.
- 189 By a Fibro-serous Membrane analogous to the Dura Mater (and originally part of the Fibro-serous lining of the Skull, according to Breschet); the external Layer is analogous to the Periosteum; and the internal Layer is Serous.
- 190 That of Secretion.
- 191 Aqua Labyrinthi, vel Liquor Cotunnii, vel Perilymph.
- 192 It lines the whole of the Osseous Labyrinth, viz: the Vestibule, semicircular Canals and Scalæ of the Cochlea; it also lines the Aqueducts of the Vestibule and Cochlea, and, by its extension, closes the two openings (Fenestra Ovalis vel Vestibuli and Fenestra Rotunda vel Cochleæ); (it must be understood that these two Apertures have other Layers which assist to close

- them, viz : the Membrane of the Tympanum and an intermediate Layer).
- 193 The thin delicate Layer which takes the form of the Vestibule and the semicircular Canals, and consists of two distinct Sacs.
- 194 The Utricle and the Sacculæ (Utriculus Communis et Sacculus Proprius).
- 195 The Utricle.
- 196 Oval, and situated at the upper and posterior part of the Vestibule.
- 197 Somewhat rounded, & situated anteriorly to the Utricle.
- 198 A limpid Fluid secreted by the internal or Serous Layer.
- 199 It is difficult to say, being at the present day undecided.
- 200 It is composed of an external or Serous Layer, a Vascular Layer, a Nervous Layer, and an internal or Serous Layer.
- 201 Endolymph vel Liquor Scarpæ.
- 202 The Perilymph vel Aqua Labyrinthi.
- 203 Otoconites (Breschet.)
- 204 Carbonate and Phosphate of Lime, which are held together by animal matter.
- 205 Just at that part where the Nerves spread out upon them.
- 206 The Hiatus Fallopii, Meatus Internus et Aquæductus Fallopii.
- 207 The posterior Branch of the Spheno-palatine (or Meekel's) Ganglion, called the Pterygoid or Vidian Nerve.
- 208 This oblique Osseous Canal, situated in the posterior surface of the Petrous Bone, contains the Auditory and Facial Nerve, each separated by a slight Ridge of Bone.
- 209 Into two Branches, an anterior and a posterior.
- 210 The Cochlear Nerve.
- 211 The Vestibular Nerve.
- 212 At the base of the Cochlea, its central Pillar or Modiolus being perforated by minute Foramina, to be distributed in the Tissue of the Lamina Spiralis, where they form, by numerous communications, a Nervous Layer or Membrane.
- 213 By dividing into three Branches, which supply the Labyrinth, viz : a superior, middle, and inferior Branch.
- 214 To the Utricle.
- 215 To the Sacculæ.
- 216 To the Ampullary Expansion of the middle or posterior vertical semicircular Canal, where they form Nervous Expansions.

- 217 The inferior Branch.
- 218 Yes.
- 219 Lamina Cribrosa,—so called from its numerous perforations.
- 220 A small Osseous Canal, which is lodged in the Petrous Bone.
- 221 At the upper and inner part of the Meatus Auditorius Internus, & terminates in the Stylo-mastoid Foramen.
- 222 The Facial Nerve (Portio Dura).
- 223 From a Branch derived from the superior Cerebellar Artery, which accompanies the Auditory Nerve into the internal Meatus, and which divides into two Branches—the Vestibular and Cochlear, which subdivide into smaller Branches.
- 224 Into the superior Petrosal Sinus in the base of the Skull.
- 225 A Nerve of Sensation.
- 226 A Nerve of Motion.

USE OF THE PARTS OF THE EAR.

- 227 To collect the undulations or vibrations of the air (the sound), and reflect them towards the external Meatus.
- 228 To concentrate and convey those sonorous vibrations to the Membrana Tympani.
- 229 To transmit the vibrations to the Bones within the Tympanum.
- 230 To regulate the tension of the Membrana Tympani.
- 231 By their motions they multiply the vibrations they receive from the Membrana Tympani, and transmit them to the Fluid in the Labyrinth.
- 232 This Fluid, being incompressible, transmits the undulations which it receives all over the fine Nervous Membrane which lines the Labyrinth.
- 233 The Auditory Nerve.
- 234 This Canal, admitting the free entrance of air into and from the Cavity of the Tympanum, preserves a due balance or equilibrium with the external air, and thus enables the Membrana Tympani to act in obedience to the slightest impressions.

SECTION XXIX.—THE MOUTH AND ORGAN OF TASTE.

- 1 The irregular Cavity which is situated below that of the Nose, extending from the Lips in front to the Fauces behind.

- 2 The Organ of Taste, and the chief instruments for mastication.
- 3 Osseous and Muscular; anteriorly, by the Lips; posteriorly, by the Fauces; laterally, by the inner surfaces of the Cheeks; above, by the Hard and Soft Palate (which are limited by the Teeth of the superior Maxilla); and below, by the Tongue (which is limited anteriorly by the Teeth of the inferior Maxilla).
- 4 The superior and inferior Maxillary Bones, the two Palate Bones, and the Teeth.
- 5 Into two parts: external and internal.

EXTERNAL PARTS OF THE MOUTH.

- 6 The Lips and Cheeks.
- 7 Two fleshy Folds which surround the Opening of the Mouth.
- 8 Externally of the Integument, internally of Mucous Membrane, and between the two the Muscle of the Lips (Orbicularis Oris); also some Adipose Tissue and the Labial Glands, with the Vessels and Nerves, corresponding with each Symphysis.
- 9 By two Folds of Mucous Membrane; the upper called Frænum Labii Superioris; the lower, Frænum Labii Inferioris.
- 10 A Groove or Furrow extending downwards from the Septum Nares; in some instances it is double.
- 11 The Commissure.
- 12 Extremely Vascular.
- 13 From the Commissure of the Lips to the Ramus of the Jaw.
- 14 The Buccinators.
- 15 Like the Lips, externally of Integument, internally of Mucous Membrane, and between the two of Muscles (Buccinators), Adipose Tissue, and Buccal Glands, with the Vessels and Nerves.
- 16 The Parotid or Stenon's Duct.
- 17 Anteriorly with the common Integument, and posteriorly with that of the Pharynx.

INTERNAL PARTS OF THE MOUTH.

- 18 The Gums, the Hard and Soft Palate, the Tonsils, the Salivary Glands with their Excretory Ducts, Isthmus of the Fauces, and the Organ of Taste—the Tongue.
- 19 The Gums cover both surfaces of the Alveolar Processes, and surround the Necks of the Teeth.

- 20 Of a thick and dense Membrane, which is very adherent to the Periosteum of the Alveolar Processes.
- 21 Hard and insensible.
- 22 Anteriorly and laterally by the Alveolar Processes and Gums, and posteriorly by the Soft Palate.
- 23 By the superior Maxillary and Palate Bones.
- 24 An elevated Raphe.
- 25 A number of transverse Ridges and Grooves.
- 26 The termination of the Naso-palatine Canal.
- 27 A Fold of Mucous Membrane, which forms a partial and moveable curtain between the Mouth and Pharynx.
- 28 Mucous Membrane, Glands, and Muscles.
- 29 The posterior margin of the Hard Palate.
- 30 This border is free and unattached, and has hanging from its middle a small conical Process, called the Uvula.
- 31 Two curved Folds called the Arches or Pillars of the Palate.
- 32 From their position into anterior and posterior.
- 33 It passes downwards to the side and base of the Tongue, and is formed by Mucous Membrane, and part of the Palato-glossus Muscle on either side.
- 34 The Isthmus of the Fauces.
- 35 It passes downwards and backwards into the Pharynx, and is formed by Mucous Membrane and part of the Palato-pharyngeus Muscle on either side.
- 36 A triangular interval on either side.
- 37 The Tonsils (Amygdalæ).
- 38 Two oval Glandular Bodies, sometimes called Amygdalæ.
- 39 Cellular, and consist of an assemblage of Muciparous Follicles, which open on the surface.
- 40 The superior Constrictor Muscle and angle of the lower Jaw.

SALIVARY GLANDS.

- 41 The Parotid, Sub-maxillary, and Sub-lingual Glands.
- 42 The Parotid.
- 43 Between the external Ear and Ramus of the lower Jaw.
- 44 From the Zygoma above to a level with the angle of the lower Jaw and Mastoid Process below, and laterally from the external Meatus and anterior margin of the Mastoid Process to the Ramus of the Jaw and Masseter Muscle.
- 45 Socia Parotidis.
- 46 The external Carotid Artery, Temporo-maxillary Vein, and Facial Nerve.

- 47 The Trunk of the Temporal Artery.
- 48 It is composed of small Lobules (connected together by Cellular Tissue) each of which is composed of the Cæcal Pouches of the Excretory Duct, surrounded by a net-work of Capillary Vessels.
- 49 Stenon's Duct.
- 50 Obliquely, nearly opposite the second Molar Tooth of the upper Jaw.
- 51 By minute Cæcal or Saccular extremities which issue from the Lobules of the Gland, and which uniting to form larger Tubes, finally terminate in one Duct, which opens as just stated.
- 52 About two-and-a-half inches in length.
- 53 It is composed of an external or Fibrous Coat and an internal or Mucous Coat.
- 54 Yes, with Epithelium.
- 55 From the external Carotid.
- 56 From the Sympathetic; the Auriculo-temporal is derived from the inferior Maxillary Nerve, the Facial and one of the superficial ascending Branches of the Cervical Plexus—the Auricularis Magnus.

SUB-MAXILLARY GLANDS.

- 57 Behind and beneath the Ramus of the Jaw, in the anterior part of the Sub-maxillary triangular space limited by that Bone and the Digastric Muscle.
- 58 The Mylo-hyoideus.
- 59 The Digastric.
- 60 The Stylo-maxillary Ligament.
- 61 The Facial Artery.
- 62 Integument, the Platysma Myoides, and deep Cervical Fascia.
- 63 Wharton's Duct.
- 64 By the side of the Frænum Linguae.
- 65 The Mylo-hyoid.
- 66 Analogous to that of the Parotid Gland.
- 67 Three: an external or Fibrous, a middle or Muscular, and an internal or Mucous Coat.
- 68 About two inches in length.

SUB-LINGUAL GLANDS.

- 69 The Sub-lingual Glands.
- 70 Beneath the anterior part of the Tongue on either side the Symphysis of the lower Jaw, and close to the side of the Frænum.

- 71 By seven or eight small Ducts, which open beneath the Tongue on either side its Frænum.
 72 Analogous to the other Salivary Glands.
 73 In having only two Coats, whilst the Sub-maxillary possesses also a middle or Muscular Coat (Kölliker).

ISTHMUS OF THE FAUCES.

- 74 The space between the Mouth and Fauces or Throat.
 75 Above, by the Soft Palate; below; by the Root of the Tongue; and on either side, by the Arches or Pillars of the Soft Palate.

TONGUE.

- 76 The Organ of Taste.
 77 Of an Ovoid shape, with its base or larger end directed backwards, and its apex or tip forwards; and occupies the Floor of the Mouth.
 78 The Incisor Teeth.
 79 The Os Hyoides, by Muscular attachment.
 80 By three Folds of Mucous Membrane: a central and two lateral, called Fræna Epiglottidis.
 81 By Mucous Membrane.
 82 By a Fold of Mucous Membrane called Frænum Linguae.
 83 Somewhat convex.
 84 Into two symmetrical parts, by a slight Groove or Raphe.
 85 Four.
 86 The Conical, the Filiform, the Fungiform, and the Calciform.
 87 They exist throughout the whole surface of the Tongue, but most numerous on the anterior two-thirds.
 88 Backwards.
 89 These are less numerous than the two preceding, but larger and more rounded; they are scattered over the surface, but most abundant at the apex and sides of the Tongue.
 90 These are still less numerous—from fifteen to twenty in number, and of larger size; they form a row on either side the Dorsum of the Tongue, and meet at the middle line, like the letter A.
 91 Foramen Cæcum.
 92 They consist of the ultimate terminations of the Gustatory Nerve and Capillary Vessels, united by fine Cellular Tissue.
 93 A firm Lamella of Cellulo-fibrous Tissue.
 94 From the base to the apex of the Tongue.

- 95 Muscular Fibres and Adipose Tissue, with the Lingual Vessels and Nerves.
- 96 By means of a special fibrous structure called the Hypo-glossal Membrane.
- 97 An Aponeurosis derived from the Genio-hyo-glossus Muscle on either side.
- 98 The Skin along the outer borders of the Lips; internally, with the Salivary Glands and their Ducts, with the Tonsils, and from thence into the Larynx and Pharynx, where it becomes continuous with the Gastro-pulmonary Mucous Membrane.
- 99 The Labial, Palatine, Buccal, Lingual Glands, &c.
- 100 Genio-hyo-glossus, Hyo-glossus, Lingualis, Stylo-glossus, and Palato-glossus.
- 101 Very irregular, some longitudinally, others obliquely, others again transversely.
- 102 From Branches of the Lingual Artery.
- 103 Into the Lingual Veins, which terminate in the internal Jugular Vein.
- 104 From three sources: the Gustatory, which is derived from the internal Trunk of the inferior Maxillary Nerve; the Lingual or Hypo-glossal Nerve; and the Glosso-pharyngeal Nerve, which latter forms one of the divisions of the eighth pair.
- 105 The Gustatory Nerve, which is distributed to the Papillæ.
- 106 The Lingual, which is distributed to the Muscles of the Tongue.
- 107 The Glosso-Pharyngeal Nerve, which is distributed to the lining Membrane and Lingual Glands.

SECTION XXX.—ORGAN OF TOUCH.

- 1 The Skin (Cutis).
- 2 Three Layers: the Cuticle, the Rete-mucosum, and the Cutis Vera or true Skin.
- 3 The Cuticle is the external, the Rete-mucosum the middle, and the Cutis Vera the innermost, Layer.
- 4 The thin transparent Membrane which covers the Rete-mucosum and Cutis Vera.
- 5 In the Palms of the Hands and the Soles of the Feet.
- 6 A net-work of waving and uneven lines.
- 7 Perfectly smooth and uniform.
- 8 It is unorganised, being destitute of Vessels and Nerves.
- 9 It is composed of a great number of minute Cells, which are disposed in Laminæ on the outer surface of the Cutis Vera, and which are secreted by it.

- 10 The elevations of the Papillæ.
- 11 The Orifices of the Perspiratory Ducts and the passage of the Hairs.
- 12 The Orifices of the Sebaceous Glands, those of the Perspiratory Ducts, and those for the passage of the Hairs.

RETE MUCOSUM.

- 13 The soft, delicate, net-like substance, which is situated immediately under the Cuticle and on the Papillary surface of the Corium.
- 14 In the Rete-mucosum, which in Europeans and Northern Asiatics is white, whilst in the Indians, Africans and Americans it is almost black or of a dark-brown colour.
- 15 Malpighi.
- 16 No.
- 17 Like the Cuticle, it is secreted by the Vascular surface of the Corium, and consists of the deeper or last-formed portion of the Cuticle.
- 18 In the white or European races.
- 19 Chaussier and Bichât.

CUTIS VERA.

- 20 It invests the entire surface of the Body.
- 21 Two: the Corium and Papillary Layer.
- 22 It consists of an interlacement of dense Filaments forming a net-work on the under surface, which encloses spaces or Areolæ, in which are lodged Granules or small Masses of Fat.
- 23 They are more closely united and form a smoother surface, on which is studded a great number of minute Processes called Papillæ, and which constitute the second or Papillary Layer.
- 24 No; it is thickest in the Palms of the Hands and the Soles of the Feet, particularly on the Heel and Ball of the Great Toe, and very thin on the extremities of the Fingers, Lips, Eyelids, &c.
- 25 It is soft, and covers the whole surface of the Corium.
- 26 It consists of the ultimate extremities of the Nerves and Capillary Vessels, united by a fine Connective Tissue.
- 27 In the Palms of the Hands and Soles of the Feet.
- 28 They are disposed in Ridges, separated by corresponding Furrows.
- 29 The Sense of Touch resides in the Papillæ, and is most acute at the Tips of the Fingers; it is also very acute in the Lips.

- 30 The Skin of the Eyelids, Scrotum, and the Penis.
 31 An Oleaginous Fluid which is supposed to be contained in distinct Vesicles having no direct communication with each other.
 32 It serves as a reservoir of nourishment, fills up interstices or spaces; its chief seat in youth is under the Skin—it also guards against pressure.

APPENDAGES TO THE SKIN.

- 33 The Hairs, Nails, Sebaceous Follicles, and Perspiratory Glands with their Ducts.
 34 Slender Filaments developed chiefly in the Scalp, Axilla, Chin, and Pubes.
 35 Into a Stem and Root.
 36 Reniform.
 37 It consists of two parts: an external which is dense and firm, and an internal which is Cellular.
 38 Free and unattached, and of various colours in different persons.
 39 It expands and forms a Tube which is somewhat conical at the Roots, and presents a soft gelatinous appearance at its margin.
 40 A Papilla of the Cutis, *i.e.* the Root or Bulb of each Hair is received into each Tubular Follicle of the Skin, and thus becomes implanted upon its corresponding Papilla.

NAILS.

- 41 Of the Cuticle, being composed of the same structure, and, like it, secreted by the true Skin.
 42 White and thinner than the other portions of the Nail.
 43 It is received into a Sulcus or Groove of the Corium.
 44 Convex, and marked by longitudinal lines.
 45 Lunula.

SEBACEOUS FOLLICLES.

- 46 In the substance of the Skin, opening on its surface.
 47 In the Nose, Cheeks, Ears, Armpits, Groins, &c.
 48 They secrete an Unctuous Fluid which protects the Cuticle from the effects of heat and friction.

PERSPIRATORY GLANDS.

- 49 In the Adipose Tissue of the Corium.
 50 These small spiral Tubes open on the surface of the Cuticle or Epidermis.
 51 After a good walk or other strong exercise of the body, when the Perspiratory Fluid, especially of the Hands and Forehead, is seen exuding through their Orifices.

THYROID GLAND.

- 1 It is situated upon the upper part of the Trachea.
- 2 Two parts or Lobes, which are united to each other by a transverse piece called the Isthmus.
- 3 Opposite the upper Rings of the Trachea (corresponding to the second and third Rings).
- 4 Somewhat Ovoid, and about two inches in length.
- 5 The Sterno-thyroid, Sterno-hyoid, and Omo-hyoid.
- 6 A dark-brown, and weighs about twelve drachms.
- 7 Bronchocele or Goitre.
- 8 Levator Glandulæ Thyroidææ (Sømmerring).
- 9 The Hyoid Bone.
- 10 Its function is unknown.
- 11 From the superior and inferior Thyroid Arteries.
- 12 The superior and middle Thyroid Veins to the internal Jugular Vein, and the inferior Thyroid Vein on either side to its corresponding Vena Innominata.
- 13 From the Par-vagus (its superior Laryngeal Branch) and the Sympathetic.

SECTION XXXI.—ANGEOLGY.

- 1 The Arteries are cylindrical Vessels which convey the Blood from the Ventricles of the Heart to all parts of the Body.
- 2 By being whiter, denser, firmer, and more elastic; their Apertures gape in the living body; and by their Pulsation.
- 3 The Pulmonary Artery and the Aorta.
- 4 To the Lungs.
- 5 To every part of the Body.
- 6 In five different ways: firstly, in Veins by continuity of Canal; secondly, in Secreting extremities as Exhalents, on the Skin and various internal Cavities; thirdly, in Glands, Secreting the various Fluids; fourthly, in Cellular Bodies, as the Spleen, Penis, &c.; and fifthly, by Anastomosis.
- 7 They are composed of three Coats: an external, middle, and internal.
- 8 Firm, strong, and of a whitish aspect; it consists of Filaments interwoven with each other similar to Felt, and directed diagonally or obliquely; this Coat is sometimes called the Cellular Coat of Arteries.
- 9 This Coat is sometimes called the Fibrous or Elastic Coat.
- 10 Circularly.

- 11 Yellowish or tawny.
- 12 This Coat, which is continued into the Ventricles of the Heart, is a delicate and almost transparent Film; and consists of longitudinal Fibres lying across the transverse Fibres of the middle Coat.
- 13 By small nutritive Vessels called Vasa Vasorum.
- 14 To the external and middle Coats only.
- 15 The Sheath.

PULMONARY ARTERY.

- 16 From the base of the right Ventricle of the Heart, anterior to the Aortic origin.
- 17 It passes upwards towards the left side for about two inches, and, opposite the Arch of the Aorta, divides into two Branches—the right and left Pulmonary Arteries.
- 18 That on the right side divides in the Root of the Lungs into three Branches, corresponding to the three Lobes of the right Lung, to which they are distributed; that on the left side divides in the Root of the Lungs into two Branches, corresponding to the two Lobes of the left Lung, to which they are distributed.
- 19 The right passes behind the Ascending Aorta, and superior Vena Cava, whilst the left passes in front of the Descending Aorta.
- 20 The right.
- 21 They divide and subdivide in the substance of the Lungs, and terminate around the Bronchial Cells, in a network of Capillary Vessels which open in the minute Radicles of the Pulmonary Veins.

AORTA.

- 22 From the left Ventricle of the Heart, just below the junction of the third Costal Cartilage with the Sternum on the left side.
- 23 Into three parts: the ascending, transverse, and the descending portions.
- 24 Nearly two inches-and-a-quarter in length.
- 25 The Pulmonary Artery, the Pericardium, and Cellular Tissue.
- 26 The right Branch of the Pulmonary Artery and right Pulmonary Veins.
- 27 The right Auricle and Descending Vena Cava.
- 28 The Pulmonary Artery and left Auricle.
- 29 The left Pneumogastric, Phrenic, and Cardiac Nerves.

- 30 The Trachea, Oesophagus, Thoracic Duct, the Cardiac Plexus, and the Recurrent Branch of the first Nerve.
- 31 The left Carotid and Arteria Innominata.
- 32 The reliok of the Arterial Duct, the right Pulmonary Artery, left Bronchus, and Recurrent Nerve.
- 33 It divides into two great Branches: the Thoracic and Abdominal Aorta.
- 34 It is situated to the left side of the Vertebral Column above the Diaphragm.
- 35 From the upper border of the fourth Dorsal Vertebra of the left side to the front of the last Dorsal Vertebra.
- 36 The Oesophagus, the Root of the left Lung, the Pericardium, and right Pneumogastric Nerve.
- 37 The Vertebrae and smaller Azygos Vein.
- 38 The Thoracic Duct and Oesophagus.
- 39 The Pleura throughout its whole length.
- 40 It enters the Abdomen between the Crura of the Diaphragm and descends towards the left side of the Vertebrae, extending from the front of the last Dorsal Vertebra to the left side of the fourth Lumbar Vertebra, where it terminates in the common Iliac Arteries.
- 41 The Solar Plexus, the Pancreas, the Splenic Vein, the transverse portion of the Duodenum, the left Renal Vein, a Fold of Peritoneum (Mesentery), and the Aortic Plexus.
- 42 The Lumbar Vertebrae, Lumbar Veins, and Thoracic Duct.
- 43 Vena Cava, Vena Azygos, and right semilunar Ganglion.
- 44 The Sympathetic Nerve and left semilunar Ganglion.
- 45 The Coeliac, two Mesenteric, and the Sacra Media.
- 46 The Coronary.
- 47 The Arteria Innominata (Brachio-cephalic, or common Trunk of the right Carotid and right Sub-clavian), the left Carotid, and the left Sub-clavian.
- 48 The Bronchial, Pericardial, Oesophageal, and Inter-costal.
- 49 Into two divisions: Visceral and Parietal.
- 50 The Cœliac Axis (which forms the Gastric, Hepatic, and Splenic Arteries), the superior and inferior Mesenteric, the Renal, the Supra-renal, and the Spermatic Arteries.
- 51 The Phrenic, Lumbar, and middle Sacral Arteries.
- 52 By dividing into the two common Iliac Arteries, opposite the left side of the body of the fourth Lumbar Vertebra.

ARTERIES OF THE HEART.

- 53 The Coronary Arteries.
 54 Two.
 55 From the Aortic Sinuses just above the semilunar Valves
 (its ascending division.)
 56 and 57 Described with the Heart,

SECTION XXXII.—ARTERIES OF THE ARCH OF
THE AORTA.

- 1 To the Head, Neck, and Upper Extremities.

ARTERIES OF THE HEAD.

- 2 Two.
 3 The right arises from the bifurcation of the Arteria
 Innominata opposite the Sterno-clavicular Articulation,
 and the left from the Aortic Arch.
 4 It ascends by the side of the Trachea from opposite the
 right Sterno-clavicular Articulation to a level with the
 Thyroid Cartilage (its upper border) where it
 divides into two Trunks, viz: the external and in-
 ternal Carotid.
 5 It ascends obliquely upwards and outwards from the
 Aortic Arch to a level with the Thyroid Cartilage
 (its upper border), where it also divides into two
 Trunks, viz: the external and internal Carotid.
 6 The Integument, Platysma Myoides, Sterno-mastoid,
 Sterno-hyoid, Sterno-thyroid, and Omo-hyoid Muscles,
 and Descendens Noni Nerve.
 7 The Longus Colli, Rectus Capitis Anticus Major, the
 Sympathetic Nerve and its Branches—the inferior
 Thyroid Artery and Recurrent Nerve.
 8 The internal Jugular Vein, the Par-vagus, and some
 Lymphatic Glands.
 9 The Trachea, Larynx, Oesophagus, and the Thyroid
 Gland.
 10 The left.

EXTERNAL CAROTID ARTERY.

- 11 It ascends from opposite the Thyroid Cartilage (its
 upper border) to the space between the Mastoid Process
 and Jaw, nearly opposite its Condyle, where it divides
 into the Temporal and internal Maxillary Arteries
 (in the substance of the Parotid Gland).
 12 Eleven.
 13 Into three groups or sets: an anterior, posterior, and
 superior.

- 14 The superior Thyroid, Lingual, and Facial.
- 15 The Occipital, posterior Auricular, and Mastoid.
- 16 The ascending Pharyngeal, transverse Facial, Parotidean, Temporal, and internal Maxillary.
- 17 From the inner side of the external Carotid Artery, just below the Cornu of the Os Hyoides; and is distributed to the Thyroid Gland.
- 18 The Hyoid, superior Laryngeal, inferior Laryngeal (or Crico-thyroid,) and Muscular (or Sterno-mastoid) Branches.
- 19 This is the second Branch of the external Carotid which is distributed to the Muscles of the Os Hyoides and Tongue, also the Sublingual Gland, and ultimately terminates in the Ranine Artery.
- 20 The Hyoid, Dorsalis Linguae, and Sub-lingual.
- 21 The inferior Palatine, the Glandular, Sub-mental, Pterygoid, inferior Labial, the two Coronary, the Lateral Nasal, and the Terminal or angular Branch at the inner angle of the Orbit.
- 22 The posterior Meningeal to the Dura Mater, and the Ramus Princeps Cervicis.
- 23 The Foramen Lacerum Posterius.
- 24 Through the medium of the Ramus Princeps Cervicis.
- 25 The Stylo-mastoid, which enters the internal Ear through the Stylo-mastoid Foramen; another small Branch is given off to supply the Occipito-frontalis.
- 26 The Sterno-mastoid Muscle and Cervical Glands.
- 27 The ascending Pharyngeal.
- 28 The Meningeal, which enters the Skull through the Foramen Lacerum Posterius to be distributed to the Dura Mater; and the Pharyngeal Branch, which supplies the Muscular structure of the Pharynx, Tonsils, Soft Palate, and Eustachian Tube.
- 29 The middle Temporal, Orbital, anterior Auricular, and Parotid Branches, each of which are distributed as their names imply.
- 30 One of the Terminal Branches of the external Carotid Artery.
- 31 In two Branches—an anterior and a posterior; the anterior or Frontal Branch supplies the Forehead and sides, and the posterior or Occipital Branch supplies the Occiput.
- 32 The anterior Branch, which inoculates with the Supra-orbital of the Ophthalmic.

- 33 The Branches of this Artery are divided into three portions, according to their position ; thus one portion arises beneath the Ramus of the Jaw, another portion beneath the Temporal Muscle, and the other portion in the Spheno-maxillary Fossa, and are respectively called the Maxillary, Pterygoid, and Pterygo-maxillary portions.
- 34 The inferior Dental, which supplies the Teeth of the lower Jaw, enters its Ramus in conjunction with the Dental Nerve through the Dental Foramen ; the middle Meningeal Branch supplies the Dura Mater, entering the Cranium through the Foramen Spinosum in the Spinous Process of the Sphenoid Bone ; the Tympanic Branch, which is distributed to the Cavity of the same name, enters the Tympanum through the Fissura Glasseri vel Glenoidalis ; and lastly, the small Meningeal Artery, which supplies the Dura Mater in the middle Fossa of the Skull, passes through the Foramen Ovale of the Sphenoid Bone in conjunction with the inferior Maxillary Nerve.
- 35 The deep Temporal (two in number), the Masseteric, the two Pterygoid (internal and external), and the Buccal, are distributed, as their names imply, to their respective Muscles.
- 36 The superior (or posterior) Dental Branch, whose Branches enter numerous small Foramina in the superior Maxilla, to supply the upper Molares and Bicuspides, also its Antrum ; the Nasal or Spheno-palatine Branch, which enters the Canal of the same name into the Nasal Cavity, to which it is distributed ; the Pterygo-palatine Branch, which passes through the Pterygo-palatine Canal, to be distributed to the Pharynx and Eustachian Tube ; the posterior Palatine Branch, which passes through the Canal of the same name, to be distributed to the Gums, Soft Palate, Tonsils, &c. ; and the Vidian or Pterygoid Branch, which passes with the Vidian Nerve into the Canal of the same name to be distributed to the Eustachian Tube and upper part of the Pharynx ; and lastly, the Infra-orbital Branch.
- 37 As their name implies, to the Parotid Gland, three and sometimes four in number ; they occasionally arise from the Temporal Artery.

- 38 From the external Carotid, whilst that Vessel is embedded in the substance of the Parotid Gland.
- 39 No; it sometimes arises from the Temporal Artery, and is distributed to the Muscles and Integument of the Face.

INTERNAL CAROTID ARTERY.

- 40 This Artery commencing at the Bifurcation of the common Carotid, opposite the Thyroid Cartilage (its upper border) at first inclines outwards, it then passes forwards and inwards, and ascends to the base of the Cranium, where it enters the Carotid Foramen in the Petrous portion of the Temporal Bone, it then passes through the Canal and Cavernous Sinus, forwards by the Sella Turcica, and upwards by the anterior Clinoid Process where it pierces the Dura Mater, and ultimately divides into three Branches.
- 41 The anterior Cerebral, the middle Cerebral, and the posterior communicating Branches.
- 42 This Artery arises opposite the inner termination of the the Sylvian Fissure, it then passes forwards to the longitudinal Fissure between the Cerebral Hemispheres, where it inosculates with its fellow by a short transverse Trunk called the anterior communicating Branch; each Vessel then passes forwards and turns round the anterior border of the Corpus Callosum, dividing into two or three Branches, which are distributed to the anterior and middle Lobes of the Brain.
- 43 This Artery, larger than the preceding, passes obliquely outwards along the Sylvian Fissure within which it divides into three or four Branches, which are distributed to the anterior and middle Lobes of the Brain.
- 44 The sides of the Circle of Willis, thus establishing a communication between the internal Carotid and Basilar Arteries.
- 45 They inosculate with the terminal Branches of the Basilar Artery (the posterior cerebral) at the anterior edge of the Pons Varolii.
- 46 The Choroid arises from the internal Carotid and sometimes from one of its terminal Branches—the middle Cerebral.
- 47 The Ophthalmic Artery.
- 48 Through the Optic Foramen at first below, and external to, the Optic Nerve, it afterwards passes above and to its inner side along the inner Wall of the Orbit and

- ultimately terminates in two Branches; the Frontal and Nasal.
- 49 These Branches are arranged, according to some Anatomists, into three sets or groups, according to others, into two sets: they are the Lachrymal, Supra-orbital, the Central Artery of the Retina, the two Ciliary, the two Ethmoidal, the two Palpebral, the Nasal, the Frontal, and the Muscular Branches.
 - 50 From the Ophthalmic, just before it enters the Optic Foramen, and is distributed to the Lachrymal Gland.
 - 51 The deep Temporal Arteries, also the middle Meningeal.
 - 52 The Supra-orbital Foramen, and supplies the Muscles and Integument of the Forehead.
 - 53 By piercing obliquely the substance of the Optic Nerve.
 - 54 Into three sets: the short or posterior, the long, and the anterior Ciliary Arteries.
 - 55 To the Choroid and Ciliary Processes.
 - 56 They vary from ten to fifteen.
 - 57 To the Iris, where they form a Vascular Zone.
 - 58 Two.
 - 59 From the Muscular Branches of the Ophthalmic Artery.
 - 60 They Anastomose with the preceding around the circumference of the Iris.
 - 61 Two: an anterior and a posterior.
 - 62 The anterior.
 - 63 They pass through the Ethmoidal Foramina in the inner Wall of the Orbit, and are distributed to the Ethmoidal Cells and Nasal Fossæ, where they freely Anastomose with the Nasal Branches of the internal Maxillary.
 - 64 Yes; they supply small Meningeal Branches to the Dura Mater (the anterior Meningeal).
 - 65 The anterior Ethmoidal Artery.
 - 66 Two: one for each Eyelid, a superior and inferior.
 - 67 The Orbital Branch of the Temporal Artery, also the Lachrymal.
 - 68 The Lachrymal Artery.
 - 69 To the Muscles of the Orbit.
 - 70 From the Palpebral Branches.
 - 71 It divides into two Branches; one communicates with the angular or Terminal Branch of the Facial Artery, and the other division runs along the side of the Nose, to which it is distributed.
 - 72 To the Muscles, Integuments, and Pericranium.

73 These Branches, two or three in number, are called *Arteriæ Receptaculi*.

SECTION XXXIII.—ARTERIES OF THE UPPER EXTREMITIES.

SUBCLAVIAN ARTERIES.

- 1 Two: one for each upper extremity.
- 2 The right arises from the *Arteria Innominata*, and the left from the posterior part of the Arch of the Aorta.
- 3 No; the course of this Vessel may for convenience be divided into three parts—the first part of the right differs from that of the left, whilst the two other parts are alike, thus, the first part of the right Subclavian passes outwards to the inner margin of the *Scalenus Anticus Muscle*; whilst the first part of the left Subclavian passes perpendicularly upwards to the inner margin of the *Scalenus Anticus*.
- 4 It forms a curve which passes outwards behind the *Scalenus Anticus Muscle*.
- 5 It passes outwards and downwards beneath the *Clavicle* and *Subclavius Muscle* to the lower border of the first Rib, where it terminates in the *Axillary Artery*.
- 6 The internal Jugular, Subclavian, and small Vertebral Veins; the *Par-vagus*, the *Phrenic* and *Cardiac Branches* of the *Sympathetic Nerve*; also, the common Integument, deep Fascia, *Sterno-mastoid*, *Sterno-thyroid*, and *Sterno-hyoid Muscles*.
- 7 The *Recurrent Branch* of the *Par-vagus*, and the *Sympathetic Nerve*; and, below, is the *Pleura*.
- 8 *Pleura* and upper part of the left Lung, the left *Brachio-cephalic Vein* (vel *Vena Innominata*), the *Par-vagus*, also, the common Integument, deep Fascia, *Sterno-mastoid*, *Thyroid* and *Hyoid Muscles*.
- 9 The *Longus Colli Muscle*, *Vertebral Column*, and the inferior *Cervical Ganglion*.
- 10 *Œsophagus* and *Thoracic Duct*.
- 11 The *Pleura*.
- 12 The *Scaleni*.
- 13 Integument, *Platysma Myoides*, deep Fascia, Branches of the *Cervical Plexus* and internal *Jugular Vein*.
- 14 It rests on the surface of the first Rib.
- 15 The *Subclavius Muscle* and *Vein*, and the *Supra-scapular Artery* and *Vein*.
- 16 The *Scalenus Posticus*.

- 17 The left.
- 18 The Vertebral, internal Mammary, Thyroid Axis, the superior Inter-costal, and the deep Cervical.
- 19 Its upper and posterior part.
- 20 It ascends through the Apertures in all the transverse Processes of the Cervical Vertebrae, except the last, it then passes upwards through the Opening of the Atlas, and piercing the Dura Mater enters the Skull through the Foramen Magnum, and finally passes forward to unite with its fellow of the opposite side at the lower border of the Pons Varolii, where it forms the Basilar Artery.
- 21 The Thoracic Duct.
- 22 To the posterior Lobes of the Brain.
- 23 By the Vertebral Arteries and the internal Carotids.
- 24 The posterior and anterior Cerebral, and the posterior and anterior communicating Branches.
- 25 The Optic Commissure, Tuber Cinereum, Infundibulum, Corpora Albicantia vel Pisiformia, and the origins of the Nervi Motores Oculorum.
- 26 The anterior and posterior Spinal, posterior Meningeal, and the inferior or posterior Cerebellar.
- 27 To the corresponding surfaces of the Spinal Cord.
- 28 Its fellow of the opposite side, also with the Spinal Branches of the Intercostal and Lumbar Arteries.
- 29 Its fellow of the opposite side, also the Spinal Branches of the Intercostal and Lumbar Arteries.
- 30 To the Dura Mater which lines the Cerebellar Fossae.
- 31 To the under surface of the Cerebellum, by numerous ramifications.
- 32 Between the origins of the Hypo-glossal or Lingual Nerves.
- 33 Its anterior and lower part.
- 34 It enters the Thorax beneath the Cartilage of the first Rib, and descends behind the Cartilages of the true Ribs to the Diaphragm, whose Fibres it pierces; it then enters the Sheath of the Rectus Muscle, where it communicates with the Epigastric Artery, a Branch of the external Iliac.
- 35 The Comes Nervi Phrenici, Mediastinal, two anterior Inter-costal, Pericardiac, Thymic, & Musculo-phrenic.
- 36 To the Diaphragm, accompanying the Phrenic Nerve.
- 37 The anterior Mediastinum, Thymus Gland, and Pericardium.

- 38 The Intercostal Muscles on the anterior part of the Chest, and Anastomose with the Aortic Intercostal Arteries.
- 39 The first three or four anterior Inter-costal Arteries.
- 40 The Thoracic Branches of the Axillary Artery.
- 41 The Diaphragm, the Abdominal Muscles, and the Intercostal Spaces.
- 42 The Transverse, the superior Cerebellar, and the posterior Cerebral.
- 43 To the Pons Varolii.
- 44 Two of the Terminal Branches of the Basilar Artery, and distributed to the upper surface of the Cerebellum.
- 45 In the inferior Cerebellar Arteries.
- 46 The other two terminal divisions of the Basilar Artery, and distributed to the posterior Lobes of the Brain.
- 47 The Motores Oculorum.
- 48 The Medulla Oblongata, Pons Varolii, posterior Lobes of the Brain, and the Cerebellum.
- 49 The Basilar Artery.

THYROID AXIS.

- 50 From the upper and front part of the Subclavian Artery, and immediately divides into three Branches: the inferior Thyroid, the Supra-scapular, and the posterior Scapular Branches.
- 51 The Thyroid Gland, Œsophagus, Trachea, and Larynx.
- 52 The Muscles on the Dorsum of the Scapula (Supra and Infra-spinal, Muscular, and Acromial Branches.)
- 53 The posterior Scapular and Dorsal Branch of the Subscapular.
- 54 The Transversalis Humeri.
- 55 The Transversalis Colli and Transverse Cervical.
- 56 The Subscapular Artery and Profunda Cervicis.
- 57 The superficial Cervical (Cervicalis anterior) and posterior Scapular, which latter is the continuation of the Vessel, and terminates with the Dorsal Branch of the Subscapular.

SUPERIOR INTERCOSTAL ARTERY.

- 58 From the lower and posterior part of the Subclavian Artery, and terminates in the first Aortic Intercostal Artery.
- 59 To the two first Intercostal Spaces.
- 60 A Branch of the Subclavian arising, in common with the superior Intercostal, from the lower and posterior part of the Artery, and sometimes called Cervicalis posterior.

AXILLARY ARTERIES.

- 61 Two: one for each upper extremity.
- 62 These Arteries form the continuation of the Subclavian Arteries through the Axillary Spaces to the upper Extremities, extending from the lower border of the first Rib to the lower borders of the Latissimus Dorsi and Teres Major Muscles.
- 63 Downwards, outwards, and backwards.
- 64 In the Brachial, on either side.
- 65 The Pectoral Muscles, and Costo-coracoid Ligament.
- 66 The first Intercostal Muscles, and first digitation of the Serratus Magnus, Axillary Vein, and the long Thoracic Nerve (external Respiratory of Sir C. Bell).
- 67 The Coraco-brachialis and Brachial Plexus.
- 68 The superior Thoracic, Acromial Thoracic, inferior or long Thoracic (or external Mammary), Subscapular, the two Circumflex Branches (anterior and posterior), the inferior Acromial, and the Alar or Axillary Thoracic.
- 69 The Pectoral Muscles.
- 70 Its Branches inosculate with the Intercostal Branches.
- 71 To the Pectoral and Deltoid Muscles.
- 72 Its Branches inosculate with the Intercostal Branches.
- 73 To the Pectoral and Serratus Muscles.
- 74 Its Branches inosculate with the Intercostal Branches.
- 75 It distributes Branches to the Mammary Gland.
- 76 From the Axillary, near the lower border of the Subscapular Muscle.
- 77 To the Serratus Magnus, Teres Major, and Latissimus Dorsi Muscles.
- 78 It gives off a Branch to the Dorsum Scapulæ.
- 79 It inosculates with the Supra-scapular and posterior Scapular Arteries.
- 80 The posterior.
- 81 The Deltoid Muscle and Shoulder Joint.
- 82 Its Branches inosculate with the anterior Circumflex and Supra-scapular Arteries.
- 83 To the Deltoid Muscle and Shoulder Joint.
- 84 Its Branches inosculate with the posterior Circumflex.
- 85 It pierces the Deltoid Muscle and inosculates on the Acromion Process with one of the Supra-scapular Branches.
- 86 This Branch, which often arises from one of the other Thoracic Branches, is distributed to the Glands and Cellular Tissue in the Axillary Space.

BRACHIAL ARTERY.

- 87 Two: one for each upper extremity.
- 88 It forms the continuation of the Axillary Artery on either side, extending from the lower borders of the Latissimus Dorsi and Teres Major to a little below the bend of the Elbow, where it divides into the Radial and Ulnar Arteries.
- 89 Downwards and forwards.
- 90 Integument, deep Fascia, Median Basilic Vein, and Tendon of the Biceps.
- 91 Long and short Heads of the Triceps, the Brachialis Anticus, and Coraco-brachialis.
- 92 The Ulnar Nerve.
- 93 The Coraco-brachialis and Biceps.
- 94 The superior Profunda, inferior Profunda, Anastomotica Magna, and the Nutritious and Muscular Branches.
- 95 A little below the Tendon of the Teres Major, and winds around the Humerus between this Bone and the Triceps, to which Muscle it is distributed.
- 96 The first Branch of the Radial (the Radial Recurrent).
- 97 The largest Branch of the Brachial Plexus (the Musculo-spiral).
- 98 Muscular Branches.
- 99 From about the middle of the Brachial Artery, opposite the insertion of the Coraco-brachialis Muscle.
- 100 The Ulnar Nerve.
- 101 The posterior Ulnar Recurrent.
- 102 About two inches above the Elbow Joint.
- 103 The inferior Profunda, and the anterior and posterior Ulnar Recurrent Branches.
- 104 To the Biceps, Triceps, Deltoid, Coraco-brachialis, and Brachialis Anticus.
- 105 About the middle of the Arm near the inferior Profunda.

RADIAL ARTERY.

- 106 One of the terminal divisions of the Brachial Artery.
- 107 It extends from the front of the division, as just stated, to the Wrist, (the anterior part of the Styloid Process of the Radius).
- 108 The common Integument, deep Fascia, and Supinator Longus Muscle.
- 109 The Supinator Brevis, Pronator Radii Teres, Flexor Sublimis Digitorum, Flexor Longus Pollicis, and Pronator Quadratus.

- 110 Above, the Pronator Teres, and, below, the Flexor Carpi Radialis.
- 111 The Supinator Longus and the Radial Branch of the Musculo-spiral Nerve.
- 112 Between those of the Flexor Carpi Radialis and Supinator Radii Longus.
- 113 Into three sets, viz: those of the Forearm, Wrist, and Hand.
- 114 The Muscular and Recurrent Radial.
- 115 Its Branches inosculate with the superior Profunda.
- 116 Superficial, Volar, anterior and posterior Carpal, Metacarpal, and Dorsales Pollicis.
- 117 By the terminal Branches of the superficial Volar with those of the Ulnar Artery.
- 118 The Radial Artery, its terminal Branch—the Arcus Volæ Profundus.
- 119 The Recurrent, three Perforating, and two or three Palmar Interosseous Branches.
- 120 By inosculating with the anterior Carpal of the Ulnar Artery.
- 121 By inosculating with the posterior Carpal of the Ulnar Artery.
- 122 By inosculating with the Digital Artery of the superficial Palmar Arch.
- 123 The index and middle Fingers.
- 124 The Dorsal surface of the Thumb, corresponding in their course to its Radial and Ulnar Borders.
- 125 The large Branch of the Thumb vel Arteria Princeps Pollicis, the Digital Branch of the Index Finger vel Arteria Radialis Indicis, the Interosseous and Perforating Branches.
- 126 Between the Abductor Indicis and Flexor Brevis Pollicis, between the Heads of which last-named Muscle, it divides into two Digital Branches, which are distributed to the two sides of the Palmar surface of the Thumb.
- ULNAR ARTERY.
- 127 The other terminal division of the Brachial Artery.
- 128 The Ulnar Artery.
- 129 This Artery in the upper half of its course inclines obliquely inwards, it then crosses the Arm, running down the Ulnar side to the Wrist, where it passes over the Annular Ligament and forms, with the terminal Branches of the superficial Volar Artery, the superficial Palmar Arch.

- 130 Its upper half is in relation with the superficial Muscles of the Forearm, viz: Pronator Radii Teres, Flexor Carpi Radialis, Flexor Sublimis Digitorum, and Palmaris Longus, and, below the Artery, becomes superficial where it lies between the Tendons of the Flexor Carpi Ulnaris and Flexor Digitorum Sublimis, being covered merely by the common Integument and Fascia of the Arm.
- 131 Above, the Brachialis Anticus and Flexor Profundus Digitorum; and below, the Pronator Quadratus and Annular Ligament.
- 132 Flexor Carpi Ulnaris, and the Ulnar Nerve at the middle of the Forearm accompanies the Ulnar Artery.
- 133 The Flexor Digitorum Sublimis.
- 134 The Venæ Comites, one on either side the Artery.
- 135 To its inner side for about one inch is the Median Nerve, which is soon separated from it by the origin of the Pronator Radii Teres, between the Heads of which Muscle it passes.
- 136 Like the Radial, they may be arranged into three sets, viz: those of the Forearm, Wrist, and Hand.
- 137 The anterior and posterior Ulnar Recurrent, the anterior and posterior Interosseous and Muscular.
- 138 It inosculates beneath the Pronator Radii Teres with the Anastomotica Magna of the Brachial.
- 139 It inosculates with the Anastomotica Magna and inferior Profunda.
- 140 The anterior and posterior Interosseous Arteries.
- 141 It inosculates with the posterior Interosseous, also the Carpal Branches of the Radial and Ulnar.
- 142 Yes; several offsets—one accompanies the Median Nerve, called the Median Artery.
- 143 It inosculates with the anterior Interosseous and Carpal Branches.
- 144 Like the anterior Interosseous, it gives off several offsets—the chief of which is the Recurrent Branch, which inosculates with the superior Profunda of the Brachial.
- 145 The anterior and posterior Carpal Branches (or Palmar and Dorsal,) and the Digital Branches.
- 146 They inosculate with similar offsets from the Radial Artery.
- 147 Four; which arise from the convexity of the superficial Palmar Arch.

- 148 The Ulnar side of the little Finger.
- 149 The contiguous borders of the ring and little Fingers.
- 150 The contiguous borders of the ring and middle Fingers.
- 151 The corresponding sides of the middle and index Fingers.
- 152 The Radial Artery.
- 153 The Os Pisiforme.

SECTION XXXIV.—THORACIC ARTERIES.

THORACIC AORTA.

- 1 The Bronchial, Pericardial, Œsophageal, and Intercostal.
- 2 From the anterior part of the Thoracic Aorta.
- 3 The Nutrient Vessels of the Lungs.
- 4 Uncertain; sometimes three and sometimes four.
- 5 The substance of the Lungs; they also give some offsets to the Pericardium and Œsophagus.
- 6 From four to six in number, and arise from the anterior part of the Thoracic Aorta, towards the right side.
- 7 The Œsophagus, and communicate with each other; the superior anastomose also with Branches of the inferior Thyroid Artery (Œsophageal), and the inferior with Branches of the Coronary Artery of the Stomach (the Gastric).
- 8 These Arteries, nine or ten on either side, arise in pairs from the posterior part of the Thoracic Aorta.
- 9 Those of the right side.
- 10 From the circumstance of the Aorta lying on the left side the Vertebral Column.
- 11 They divide in the Intercostal Spaces into an anterior and a posterior Branch; the former supplying the Intercostal Muscles, &c., and the latter, the Muscles of the Back.
- 12 By the superior Intercostal Artery, derived from the Subclavian Artery.

SECTION XXXV.—ABDOMINAL AORTA.

- 1 These Arteries are arranged into two divisions (Visceral and Parietal): the first consists of the Cæliac Axis, the superior and inferior Mesenteric, the Emulgent or Renal, the Supra-renal or Capsular, and the Spermatic Arteries.
- 2 From the anterior part of the Abdominal Aorta between the Crura of the Diaphragm, opposite the junction or union of the last Dorsal with the first Lumbar Vertebra.
- 3 The Coronary or Gastric, Hepatic, and the Splenic.

- 4 The Coronary (*Coronaria Ventriculi*).
- 5 It passes upwards between the two Layers of the lesser Omentum to the left or Cardiac Orifice of the Stomach, it then turns to the right, running along the upper or lesser curve of the Stomach to its Pyloric extremity, where it anastomoses with the Pyloric Branch of the Hepatic Artery.
- 6 Oesophageal, Splenic, and Gastric Branches.
- 7 This Artery, in its course to the Liver, passes upwards along the right border of the little Omentum, and divides near the transverse Fissure into two terminal Branches—the right and left Hepatic Branches, which latter supply the substance of the Liver.
- 8 The Pyloric, the right Gastro-epiploic (*Gastro-epiploica Dextra*), and the terminal or right and left Hepatic Branches.
- 9 It inosculates with the Coronary Artery.
- 10 The Pancreatico-duodenal, superior and inferior Pyloric.
- 11 It inosculates with the left Gastro-epiploic Branch of the Splenic Artery.
- 12 It inosculates with a small Branch from the superior Mesenteric Artery (the inferior Pancreatico-duodenal Branch).
- 13 The Cystic Artery.
- 14 From its origin to its division into the Pancreatico-duodenal Branch.
- 15 The Splenic.
- 16 It runs transversely along the upper border of the Pancreas to the left side.
- 17 It divides into six or eight Terminal Branches, which enter the substance of the Spleen, to which they are distributed; from the circumstance of the Splenic Tissue being so soft, it is extremely difficult to trace them to their terminations.
- 18 The Pancreatic, the left Gastro-epiploic (*Arteria Gastro-epiploica Sinistra*), and the *Vasa Brevia*.
- 19 To the Pancreatic Gland, and one—the *Arteria Pancreatica Magna*—accompanies the Duct through the substance of the Gland.
- 20 This Branch, larger than the rest, appears to be continuous with the Splenic Artery; it inosculates with the *Gastro-epiploica Dextra* of the Hepatic Artery, and supplies the anterior and posterior surfaces of the Stomach and Greater Omentum.

21 These Branches, five or six in number, ramify in the Coats of the Stomach, and inosculate with Branches of the Coronary and left Gastro-epiploic Arteries,—thus completing on the left side the Vascular Zone which surrounds the Stomach.

22 The Stomach.

SUPERIOR MESENTERIC ARTERY.

23 From the anterior part of the Aorta just below the Cœliac Axis (about a quarter-of-an-inch below).

24 It descends obliquely to the left, at first behind the Pancreas, and then enters between the two Laminae or Folds of the Mesentery, it then takes a sweep obliquely to the right, and terminates in the right Iliac Fossa; in this course it forms an arch, from which Arch or Curve several small Branches arise.

25 The Rami Intestini Tenuis, the Pancreatico-duodenalis Inferior, Ileo-colica, Colica Dextra, and Colica Media.

26 These Branches, sixteen to eighteen in number, arise from the Convexity or Arch of the superior Mesenteric Artery, communicating with each other, and are distributed to the Jejunum and Ilium.

27 The Arteria Ileo-colica, Colica Dextra et Colica Media.

28 From the Concavity on the right side of the superior Mesenteric Artery, it descends to the Cæcum, and divides into Branches which supply this Pouch, also the last portion of the Ilium and the first portion of the Colon.

29 It inosculates with the Terminal Intestinal Branches and the right Colic Branch of the superior Mesenteric Artery.

30 From the Concavity on the right side of the superior Mesenteric Artery.

31 To the right or ascending Colon; and terminates by inosculating with the Ileo-colic and middle Colic Branches.

32 From the Concavity on the right side of the superior Mesenteric Artery.

33 To the Transverse Colon; and terminates by inosculating with the Colicus Dexter of the superior Mesenteric Artery, and the Colicus Sinister or left Colic of the inferior Mesenteric Artery.

INFERIOR MESENTERIC ARTERY.

34 From the anterior part of the Abdominal portion of the descending Aorta, about one finger's breadth below the Spermatic Arteries.

- 35 It descends at first on the Aorta, and then crosses to the left Iliac Fossa, between the Folds of the left Meso-colon, where it terminates in three Branches: the left Colic (Ramus Colicus Sinister,) the Sigmoid (Ramus Sigmoideus), and the superior Hæmorrhoidal (Ramus Hæmorrhoidalis Superior).
- 36 To the descending Colon; and inosculates with the middle Colic Branch of the superior Mesenteric Artery and the Sigmoid Branch.
- 37 To the Sigmoid Flexure of the Colon; and inosculates with the left Colic and superior Hæmorrhoidal Branches.
- 38 To the lower part of the Rectum, and forms the terminal Branch of the inferior Mesenteric Artery.
- 39 The middle and external or inferior Hæmorrhoidal Branches, the former derived from the anterior Trunk of the internal Iliac, and the latter from the internal Pudic, external to the Pelvis.

RENAL ARTERIES.

- 40 From the sides of the Abdominal Aorta just below the superior Mesenteric.
- 41 Transversely outwards, with a slight inclination backwards and downwards.
- 42 The right.
- 43 On account of the position of the Aorta, as it has to cross the Spinal Column.
- 44 The left.
- 45 They each divide into four or five Branches which enter the substance of the Kidney between its Vein and Ureter.

SUPRA-RENAL ARTERIES.

- 46 They are somewhat irregular in their origin; sometimes from the Aorta on a level with the superior Mesenteric Artery, sometimes from the Phrenic; the right sometimes arises from the right Renal.
- 47 They are distributed to the Supra-renal Bodies, inosculating with the Phrenic and Renal Arteries.

SPERMATIC ARTERIES.

- 48 From the anterior part of the Aorta a little below the Renal Arteries (between them and the inferior Mesenteric Artery.)
- 49 Each descends obliquely outwards and downwards along the posterior Wall of the Abdomen on the Psoas Muscle, and beneath the Peritoneum to the internal Abdominal Ring through which it passes, accom-

- panying the Spermatic Cord along the Canal to its termination in the Testis, to which it is distributed.
- 50 They descend into the Pelvis, passing between the two Folds of the broad Ligaments, and are distributed to the Ovaria and Uterus.
 - 51 They anastomose with the Arteries of the Uterus.
 - 52 The Phrenic, Lumbar, and middle Sacral Arteries.
 - 53 From the fore part of the Aorta, close to the inferior surface of the Diaphragm.
 - 54 Each passes outwards along the inferior surface of the Diaphragm, and terminate in Anastomotic Branches—an internal and an external Branch.
 - 55 With its fellow of the opposite side.
 - 56 It anastomoses with the Intercostal Arteries.
 - 57 With the Musculo-phrenic (derived from the internal Mammary,) Oesophageal, Gastric, & Capsular Arteries.
 - 58 To the Diaphragm, Pancreas, and Supra-renal Capsules; the left Phrenic supplies Branches to the Spleen and Oesophagus, the right, the Vena Cava at its termination.
 - 59 These Arteries (four or five on either side) are analogous to the Intercostal Arteries in the Chest in their mode of origin, course, and size; they arise from the posterior part of the Abdominal Aorta opposite the centre of the Lumbar Vertebrae.
 - 60 In two Branches—Dorsal and Abdominal—between the Longissimus Dorsi and Multifidus Spinæ Muscles.
 - 61 To the deep-seated Lumbar Muscles, *e.g.* Multifidus Spinæ, Erector Spinæ.
 - 62 The Transverse Processes of the Lumbar Vertebrae.
 - 63 A Spinal Branch.
 - 64 The Abdominal Muscles.
 - 65 They inosculate with the inferior Intercostal, the Iliolumbar (from the internal Iliac), and the Circumflex Iliac (from the external Iliac) Arteries.
 - 66 From the extremity of the Aorta—its Bifurcation; sometimes from the posterior part, a little above its division.
 - 67 It passes downwards along the middle line to the Coccyx, where it terminates on either side by anastomosing with the lateral Sacral Arteries; these latter are derived from the posterior Trunk of the internal Iliac Artery.
 - 68 To the Rectum, the anterior Sacral Nerves, the Sacrum, and Muscles attached to this Bone.
 - 69 The Phrenic, Supra-renal, Renal, Spermatic, and Lumbar.

- 70 Cæliac Axis, superior and inferior Mesenteric, and the middle Sacral.

SECTION XXXVI.—PELVIC ARTERIES.

- 1 The two common Iliac Arteries, also the middle Sacral, which latter has just been described.
- 2 Opposite the junction of the fourth and fifth Lumbar Vertebrae.
- 3 Each about two-and-a-half inches in length.
- 4 Downwards and outwards towards the base of the Sacrum (its Sacro-iliac junction) where they divide into two large Trunks—the internal and external Iliac Arteries.
- 5 The right.
- 6 From the circumstance of the Aorta being situated on the left side the Vertebral Column.
- 7 No.
- 8 Peritoneum, Ureter, and latter portion of the Ilium.
- 9 The two common Iliac Veins.
- 10 Peritoneum, Ureter, Rectum, and the Terminal Branch of the inferior Mesenteric Artery (the superior Hæmorrhoidal).
- 11 The left common Iliac Vein.

INTERNAL ILIAC ARTERY.

- 12 One of the terminal divisions of the common Iliac Artery.
- 13 About one-and-a-half inches in length.
- 14 The internal Iliac Artery, and vice-versa in the Adult.
- 15 It extends from the Sacro-iliac Junction to the great Sacro-ischiatic Notch, where it divides into two large or Primary Branches an anterior and a posterior Trunk.
- 16 Umbilical, Vesical, the middle Hæmorrhoidal and the two Terminal Branches, viz: Sciatic and Pudic.

UMBILICAL ARTERY.

- 17 The Umbilical or Hypogastric Artery forms an impervious Cord, with the exception of about one-inch-and-a-half, from which two or three superior Vesical Branches are given off to the body and upper part of the Urinary Bladder.
- 18 From the division of the common Iliac on either side it proceeds downwards and forwards to the Bladder, it then ascends to its upper part or Fundus along the Urachus to the Umbilicus, between the Peritoneum and Recti Muscles; having escaped at this Abdominal Opening, it forms a part of the Umbilical Cord twining

- around its accompanying Vein, and on arriving at the Placenta, divides into numerous Branches which ramify throughout this vascular, spongy texture.
- 19 From their position into superior and inferior.
 - 20 To the body and upper part of the Bladder.
 - 21 The posterior part of the Bladder, Prostate, and Vesiculæ Seminales.
 - 22 To the Buttock.
 - 23 Through the great Ischiatic Notch between the Pyriformis and Coccygeus Muscles.
 - 24 The Coccygeal, one to the great Ischiatic Nerve called Comes Nervi Ischiatici, and some small Muscular Branches to the back of the Hip and Thigh.
 - 25 The Coccygeus and Pyriformis Muscles.
 - 26 To the Perineum and Genital Organs, entering the Perineal Space through the small Sacro-sciatic Notch.
 - 27 It passes downwards anterior to the Sciatic Artery to the great Sacro-sciatic Notch, where it escapes from the Pelvis, it then winds over the Spine of the Ischium, and re-enters the Pelvis through the small Sacro-sciatic Notch, and is distributed to the Perineal Space.
 - 28 The Branches within the Pelvis are very small, and are distributed to the posterior part of the Bladder, the Vesiculæ Seminales, and Prostate Gland.
 - 29 No; it is frequently supplied by the Pudic ere this Artery emerges from the Pelvis.
 - 30 To the Rectum and Bladder, and in the Female to the Vagina.
 - 31 It inosculates with the inferior and superior Hæmorrhoidal Branches, the former derived from the Pudic, and the latter from the inferior Mesenteric Arteries.
 - 32 The inferior or external Hæmorrhoidal, the superficial and transverse Perineal, the Artery of the Bulb (Arteria Bulbosi), the Artery of the Cavernous Structure of the Penis (Arteria Corporis Cavernosi), and the Dorsal Artery of the Penis (Arteria Dorsalis Penis).
 - 33 To the Muscles and parts around the Anus.
 - 34 By inosculating with the superior Hæmorrhoidal Branch (derived from the inferior Mesenteric), it also communicates with its fellow of the opposite side.
 - 35 To the Perineum and Scrotum.
 - 36 By inosculating with the superficial external Pudic Branch, which is derived from the Femoral Artery.

- 37 To the Integuments and transverse Perineal Muscles.
- 38 It inosculates with its fellow of the opposite side.
- 39 To the Corpus Spongiosum, or spongy structure of the Penis.
- 40 To the Cavernous structure; it forms one of the ultimate or terminal Branches of the internal Pudic.
- 41 The other terminal Branch of the internal Pudic.
- 42 In the Glans Penis, distributing Branches in its course to the body of the Organ, also the Integument.
- 43 The Obturator, Ilio-lumbar, lateral Sacral, and Gluteal.
- 44 Through the upper part of the Obturator or Thyroid Foramen, where it divides into two Branches—an internal or Pelvic portion, and an external or Femoral portion.
- 45 To the Adductor Muscles, also the Pectineus and Gracilis.
- 46 To the Obturator and Quadratus Muscles.
- 47 It divides in the Iliac Fossa on either side into two Branches—an ascending or Lumbar Branch, and a transverse or Iliac Branch.
- 48 The Psoas, Iliacus, and Quadratus Lumborum Muscles.
- 49 It inosculates with the last Lumbar Artery.
- 50 Yes, a small Spinal Branch to the Cord & its Membranes.
- 51 An Inter-vertebral Foramen, between the last Lumbar Vertebra and the Sacrum.
- 52 The Iliacus and Abdominal Muscles.
- 53 It inosculates with the Lumbar Artery, also with the Circumflex Iliac, a Branch derived from the external Iliac Artery.
- 54 Four: two on each side, divided into superior and inferior.
- 55 The Piriformis and Coezygeus Muscles.
- 56 They inosculate with each other, also with the Lumbar Arteries, and the middle Sacral Artery.
- 57 Yes; a small Spinal Branch, which passes into the Vertebral Canal through each Sacral Foramen.
- 58 The Gluteal Artery.
- 59 The Terminal Branch of the posterior division or Trunk of the internal Iliac Artery.
- 60 Through the Great Sacro-sciatic Notch above the Piriformis Muscle.
- 61 The superficial Branch and the deep Branch, which latter divides into two—a superior and an inferior.
- 62 To the Gluteus Maximus and Integument.
- 63 The Gluteus Medius and Minimus Muscles.

- 64 It inosculates with the ascending Branches of the external Circumflex Artery, which latter is one of the Profundal Branches of the Femoral Artery.
- 65 Like the preceding Branch it inosculates with the external Circumflex Artery.

EXTERNAL ILIAC ARTERY.

- 66 The other Terminal division of the common Iliac Artery.
- 67 Within the Abdominal Cavity.
- 68 Obliquely downwards and outwards from its Bifurcation opposite the Sacro-iliac Junction to the Femoral Arch or lower border of Poupart's Ligament.
- 69 Peritoneum, the Spermatic Vessels, the Sub-peritoneal Layer, and the Ureter.
- 70 The external Iliac Vein.
- 71 The Psoas Muscle.
- 72 The Vas Deferens or Excretory Duct of the Testis.
- 73 The Epigastric and Circumflex Iliac.
- 74 From the external Iliac, about two lines above the margin of Poupart's Ligament.
- 75 At first it passes downwards and inwards, it then passes obliquely upwards and inwards between the Peritoneum and Transversalis Fascia, until it arrives midway between the Umbilicus and Pubes where it perforates the Fascia Transversalis, and enters the Sheath of the Rectus, along which it passes, and then divides into Branches which are distributed to that Muscle, and which inosculate near the Xiphoid Cartilage with the Terminal Branches of the internal Mammary Artery (a Branch of the Subclavian.)
- 76 The internal Abdominal Ring.
- 77 The Cremasteric.
- 78 To the Coverings of the Cord.
- 79 It inosculates with the Spermatic Artery (a Branch of the Aorta.)
- 80 Yes; but require no particular description, they are the Muscular, and the anterior and posterior Terminal Branches, also a small transverse Pubic Branch.
- 81 The Epigastric Artery.
- 82 From the outer side of the external Iliac, on a level with Poupart's Ligament.
- 83 It passes upwards and outwards around the Crest of the Ilium, and opposite its anterior-superior Spinous Process passes between the attachments of the internal

Oblique and Transversalis Muscles, where it is ultimately distributed.

- 84 The Ilio-lumbar (a Branch of the internal Iliac), also the Epigastric and Lumbar Arteries.

SECTION XXXVII.—ARTERIES OF THE LOWER EXTREMITIES.

FEMORAL ARTERY.

- 1 Femoral Artery is the name given to the external Iliac immediately after it has passed the lower border of Poupart's Ligament.
- 2 From the Crural Arch or lower border of Poupart's Ligament, midway between the anterior-superior spinous Process of the Ilium & the Symphysis Pubis, to the opening in the Adductor Magnus Muscle, opposite the junction of the middle with the inferior third of the Thigh.
- 3 It occupies the anterior and inner part of the Thigh in the first two-thirds of this extent, it then bends backwards till it reaches the Ham, where it becomes Popliteal.
- 4 Integument, superficial and deep Fascia, and some Inguinal Glands.
- 5 The Sartorius Muscle.
- 6 Adductor Longus, Pectineus, and the Femoral Vein at the Pubes.
- 7 The Psoas, Rectus and the Vastus Internus Muscles, also the anterior Crural Nerve (a Branch from the Lumbar Plexus).
- 8 The Psoas, the Femoral Vein, the Profunda Vein, and some Branches of the Profunda Artery, it then lies on the Adductor Longus, and, finally, the conjoined Tendon.
- 9 From the upper or superficial part of its course.
- 10 The superficial Epigastric, superficial Circumflex Iliac, the external Pudic (superior and inferior), the Profunda, the Muscular, and the Anastomoticus Magnus.
- 11 To the Integument, superficial Fascia, Cellular Tissue, and Inguinal Glands.
- 12 Its Terminal Branches inosculate with the Epigastric and internal Mammary Arteries, the former derived from the external Iliac, and the latter from the Subclavian Arteries.
- 13 To the Integument.

- 14 Its Branches inosculate with the external Circumflex (a Branch of the Profunda), and Gluteal Branches.
- 15 Two: a superior and inferior one.
- 16 To the Integument of the Penis and Scrotum.
- 17 To the Integument of the Scrotum and Perineum.
- 18 To the Labia Pudendi.
- 19 The Profunda, sometimes called the deep Femoral.
- 20 The Nutrient Vessel of the Thigh.
- 21 From the outer part of the Femoral Artery about two inches below Poupart's Ligament.
- 22 Downwards and backwards beneath the Femoral Artery and the Adductor Longus, and terminates at the lower third of the Thigh by piercing the Adductor Magnus Muscle, and distributing its Branches to the Flexors at the back of the Thigh.
- 23 The Adductor Longus and Profunda Vein.
- 24 The Pectineus, Adductor Brevis, and Magnus.
- 25 The external Circumflex, the internal Circumflex, and the Perforating Branches.
- 26 To the Extensors on the front of the Thigh.
- 27 It divides into three Branches: an ascending, transverse, and descending.
- 28 By inosculating with the Terminal Branches of the Gluteal Artery.
- 29 By inosculating with the Perforating and Sciatic Branches.
- 30 By inosculating with the external Articular Branches derived from the Popliteal Artery.
- 31 To the Muscles on the upper and inner side of the Thigh.
- 32 By inosculating with the Obturator Artery (derived from the posterior division of the internal Iliac).
- 33 Three, and called from their position—superior, middle, and inferior.
- 34 To the Back and outer part of Thigh.
- 35 By inosculating with Branches of the internal Iliac (the Sciatic).
- 36 By inosculating with the superior and inferior Perforating Branches.
- 37 By inosculating with the middle Perforating, also the Articular Branches of the Popliteal.
- 38 The second or middle Perforating Branch.
- 39 Through the medium of the Perforating Branches of the Profunda.
- 40 From the Femoral, as the latter is about to pass through the Opening in the Adductor Magnus into the Popliteal Space.

- 41 It divides at the Opening into two Branches—a superficial and deep.
- 42 To the Integument.
- 43 By inosculating with the superior internal Articular Branch of the Popliteal Artery.
- 44 To the Vastus Internus and Crureus Muscles, also the Knee-joint.
- 45 By inosculating with the superior external Articular Branch of the Popliteal, also the external Circumflex derived from the Profunda.

POPLITEAL ARTERY.

- 46 That portion of the Arterial Trunk which extends from the Opening in the Adductor Magnus to the lower border of the Popliteus Muscle, where it Bifurcates into the anterior and posterior Tibial Arteries.
- 47 Downwards and somewhat outwards through the centre of the Popliteal Space.
- 48 The Ham-string Muscles and inner Condyle.
- 49 The Ham-string Muscles, external Condyle, and Popliteal Vein.
- 50 The body of the Semimembranosus Muscle, Popliteal Nerve and Vein, Adipose Tissue, Fascia Lata, and the Integument.
- 51 The Femur (the lower part of its posterior surface) and the posterior Ligament of the Knee-joint (Ligamentum Posticum of Winslow).
- 52 Two superior Articular (external and internal), two inferior Articular (external and internal), and a central or Azygos Articular Branch.
- 53 To the upper part of the Knee-joint and lower part of the Femur.
- 54 By inosculating with its fellow of the opposite side, also the external Circumflex (derived from the deep Femoral)
- 55 By inosculating with its fellow of the opposite side, also the Anastomotica Magna (derived from the Femoral Artery).
- 56 To the lower part of the Knee-joint, also the upper parts of the Tibia and Fibula.
- 57 By inosculating with its fellow of the opposite side and the superior Articular Branches, it also inosculates with the Recurrent Branch of the anterior Tibial Artery.
- 58 By inosculating with its fellow, also the superior Articular Branches.

- 59 Several; sometimes three or four.
 60 To the Crucial Ligaments and Synovial Membrane within the Knee-joint.
 61 Yes: some Muscular Branches which supply the Gastrocnemius and Ham-string Muscles, called Sural Branches.

ANTERIOR TIBIAL ARTERY.

- 62 From the division of the Popliteal Artery to the anterior aspect of the Ankle-joint, where it assumes the name of the Dorsal Artery.
 63 It passes forwards between the two Heads of the Tibialis Posticus Muscle, through the Aperture in the upper part of the Interosseous Ligament, it then descends along the fore-part of this Ligament and the Tibia to the Ankle-joint.
 64 The deep Fascia, Extensor Proprius Pollicis, Extensor Longus Digitorum, and anterior Tibial Nerve.
 65 The Interosseous Ligament (two-thirds of its extent), the Tibia (lower third), and the Ankle-joint.
 66 The Tibialis Anticus (its upper part) and the Tendon of the Extensor Proprius Pollicis.
 67 The Extensor Longus Digitorum (its upper part), Extensor Proprius Pollicis, and the anterior Tibial Nerve at the lower end of the Artery.
 68 The Recurrent, Muscular, and Malleolar (internal and external.)
 69 As soon as the Artery has perforated the Interosseous Ligament.
 70 To the Knee-joint.
 71 It inosculates with the other Articular Branches.
 72 To the Muscles on the anterior surface of the Leg, the Tibialis Anticus, Extensor Digitorum Communis, and Extensor Proprius Pollicis, some Branches are also distributed to the Tibialis Posticus as it passes between the two Heads of this Muscle.
 73 Into two sets: external and internal.
 74 As their name implies, to the Ankle-joint.
 75 They inosculate with Branches of the anterior Peroneal Artery, also Tarsal Branches of the Arteria Dorsalis Pedis.
 76 They also inosculate with Branches derived from the posterior Tibial Artery (anterior Peroneal).

DORSAL ARTERY.

- 77 The continuation of the anterior Tibial Artery.
 78 From the anterior aspect of the Ankle-joint along the

the Dorsal or convex surface of the Foot (its Tibial side) to the posterior extremity or base of the first Metatarsal Bone.

- 79 Integument, deep Fascia, and, near its extremity, the inner tendon of the Extensor Brevis Digitorum.
- 80 The inner row of Tarsal Bones, viz : Astragalus, Scaphoid, and first Cuneiform Bone.
- 81 The Tendon of the Extensor Proprius Pollicis.
- 82 The inner Tendon of the Extensor Longus Digitorum Pedis, and Extensor Brevis Digitorum.
- 83 The Tarsal, Metatarsal, and Interosseous Branches—the latter including the first or Communicating Branch.
- 84 It inosculates with the external Malleolar, Metatarsal, and external Plantar Branches.
- 85 It forms a Curve across the Metatarsal Bones to the outer part of the Foot.
- 86 By inosculating with the preceding Branch, also the external Plantar.
- 87 From the convexity of the curve of the Metatarsal Branch the three Interosseous Branches arise.
- 88 To the three outer Interosseous Spaces, each resting on one of the Dorsal Interosseous Muscles, to which it is distributed.
- 89 They divide at the cleft between the Toes into two Ramusculi or Collateral Branches which supply the adjoining Toes.
- 90 Through the medium of the anterior and posterior Perforating Branches ; the former derived from the Digital Branches of the external Plantar, and the latter from the Plantar Arch.
- 91 The Ramus Dorsalis Pollicis Pedis, sometimes called the first Interosseous Branch.
- 92 Like the other Interosseous Branches it passes forwards in the Interosseous Space between the first and second Toes, and divides into two Branches, which are distributed to the corresponding Interosseous Muscle, also the inner surface of the great Toe.
- 93 The Communicating Branch of the Dorsal Artery of the Foot.

POSTERIOR TIBIAL ARTERY.

- 94 From the division of the Popliteal Artery opposite the lower border of the Popliteus Muscle to the inner concave surface of the Os Calcis, where it divides into two Branches, which are distributed to the Sole

- of the Foot and Toes, internal and external Plantar Arteries.
- 95 At the commencement it is situated between the Tibia and Fibula; it then passes obliquely downwards and inwards, behind the inner Ankle to the concavity of the Os Calcis.
- 96 Tibialis Posticus, Flexor Longus Digitorum.
- 97 Its upper half is covered by the Soleus and Gastrocnemius, and, lower down, only by the deep Fascia of the Leg and the Integument.
- 98 Its accompanying Veins (Venæ Comites) and the posterior Tibial Nerve.
- 99 The Peroneal, Muscular, and the nutritious Artery of the Tibia.
- 100 From the posterior Tibial Artery, nearly two inches below the origin of the latter Artery.
- 101 At first obliquely outwards to the Fibula, it then descends perpendicularly along the inner border of this Bone until it arrives at the lower part of the Interosseous Ligament, where it divides into two Branches—the anterior and posterior Peroneal Arteries.
- 102 No; according to some, the anterior Peroneal is only a Branch of the Peroneal, whilst the latter is continued over the Joint to the external surface of the Os Calcis.
- 103 By piercing the Interosseous Ligament at the lower third of the Leg, running on the anterior surface of the Fibula, beneath the Peroneus Tertius Muscle to within about two inches of the outer Malleolus; it then divides into several Branches which pass beneath the Extensor Tendons.
- 104 To the Dorsum and outer part of the Foot.
- 105 It inosculates with the external Malleolar and Tarsal Branches; the former derived from the anterior Tibial, and the latter from the Dorsal Artery.
- 106 It continues in its original course along the posterior aspect of the outer ankle to the outer surface of the Os Calcis, where it terminates in small Branches which inosculate with the Tarsal, anterior Peroneal, and external Plantar Branches.
- 107 To the Soleus and deep Flexors on the posterior aspect of the Leg, *e.g.* Flexor Longus Digitorum, Flexor Pollicis Pedis.
- 108 It enters the posterior surface of the Bone obliquely from below upwards.

109 The Tibialis Posticus.

PLANTAR ARTERIES.

- 110 The Terminal divisions of the posterior Tibial Artery.
 111 From their position into external and internal.
 112 The external, which appears to be the continuation of the posterior Tibial.
 113 It first passes obliquely outwards across the Sole of the Foot to the base of the last Metatarsal Bone, it then turns transversely inwards to the first Metatarsal Space, where it terminates by inosculating with the Communicating Branch of the Dorsal Artery.
 114 The horizontal, or that portion of the external Plantar Artery, which extends from the base of the last Metatarsal Bone to the interval or space between the first and second Metatarsal Bones, where it joins the Communicating Branch of the Dorsal Artery and forms the Plantar Arch (called the Great Plantar Arch by Harrison)
 115 Between the third and fourth Layers of Plantar Muscles.
 116 The Muscular, Digital, and the three posterior Perforating Branches.
 117 Four; which arise from the curve of the Plantar Arch.
 118 This a single Branch, and supplies the outer border of the little Toe.
 119 These Branches divide at the cleft between the three outer Metatarsal Spaces, and supply the adjacent sides of these three Spaces.
 120 Each Digital Artery at its Bifurcation gives off a small Branch called the anterior Perforating Branch.
 121 By inosculating with the Interosseous Branches of the Metatarsal (derived from the Dorsal) on the Dorsum of the Foot.
 122 From the under part of the Plantar Arch.
 123 They pass upwards to the Dorsum of the Foot between the Heads of the outer Dorsal Interosseous Muscles, through the three outer Inter-metatarsal Spaces.
 124 By inosculating with the Curve formed by the Metatarsal Branch of the Dorsal Artery.
 125 It passes forwards from its Bifurcation, along the inner border of the Foot, under cover of the Abductor Pollicis Pedis to the Root of the great Toe, to which it is distributed, it also supplies the inner border of the Foot.
 126 By inosculating with the external Plantar Artery (so as to form a superficial Plantar Arch; Harrison).

SECTION XXXVIII.—VEINS IN GENERAL.

- 1 The Veins are those Vessels by which the Blood is returned to the Auricles of the Heart from the different parts of the Body.
- 2 By being more transparent, their Coats thinner, less elastic, collapse when divided, larger than Arteries, and have no pulsation.
- 3 They commence from the extreme Branches or Capillary terminations of the Arteries throughout the various Tissues of the Body, and converge so as to form larger Vessels which ultimately terminate in the large Venous Trunks which open into the Auricles of the Heart.
- 4 They invariably accompany the Arteries with the exception of the superficial Veins.
- 5 The Veins.
- 6 Their structure resembles that of Arteries being composed of three Coats or Layers, an external or Cellular, a middle or Fibrous, and an internal or Serous Coat.
- 7 This Coat forms occasionally semilunar Folds called Valves.
- 8 To prevent the regurgitation of the Blood into the part of the Vessel from which it had just been conveyed.
- 9 They are generally arranged in pairs, with their concave or free border directed towards the Heart and meet when the Vessel is distended, thus forming a complete Septum.
- 10 No; they do not exist in the Head or Viscera.
- 11 Yes; the Vena Azygos, also the Coronary Vein of the Heart.
- 12 Six.
- 13 The four Pulmonary Veins and the superior and inferior Venæ Cavæ.
- 14 Vasa Vasorum.

SECTION XXXIX.—VEINS OF THE HEAD AND NECK.

- 1 Into four divisions, viz., those of the Head and Neck, those of the Trunk, those of the Upper Extremity, and those of the Lower Extremity.
- 2 Into two sets, external and internal.
- 3 The Facial, the Temporal, the internal Maxillary, Temporo-Maxillary, posterior Auricular & Occipital.
- 4 It commences at the side of the Root of the Nose by a small Vein called the Angular Vein, and terminates

- (after passing under the Zygomatic Muscles and crossing the Lower Border of the Jaw) in the internal Jugular Vein.
- 5 By the conflux of Branches from the Vertex, Forehead, Eyebrow and Nose, the Frontal and Supra-orbital Veins are formed, and the union of these two Veins constitutes the Angular Vein of the Face.
 - 6 Infra and Supra-orbital, Buccal, Masseteric, Labial, inferior Palpebral, Ophthalmic and Nasal.
 - 7 By minute ramifications forming Plexuses upon the Vertex or Arch of the Skull, which converging together form an anterior and posterior Branch, these then unite and pierce the Temporal Fascia just above the Zygoma and thus form the Temporal Vein.
 - 8 By uniting with the internal Maxillary Vein.
 - 9 Chiefly from the Pterygoid Plexus, which is formed from Branches corresponding to those of the Artery in the Zygomatic and Pterygoid Fossæ.
 - 10 By uniting behind the Neck of the inferior Maxilla with the Temporal Vein.
 - 11 Temporo-maxillary Vein.
 - 12 The external Jugular Vein.
 - 13 The anterior Auricular, Articular, Masseteric, transverse Facial, and Parotid Veins.
 - 14 In the Plexus on the Arch of the Skull and terminates in the Temporo-maxillary just before this Vessel assumes the name of the External Jugular Vein.
 - 15 Those from the external Ear, also the Stylo-mastoid which passes through the Foramen of the same name in the Mastoid portion of the Temporal Bone.
 - 16 In the Plexus at the back of the Head.
 - 17 In the internal Jugular Vein, and occasionally in the external Jugular Vein.
 - 18 The Lateral Sinus, through the medium of the Mastoid Foramen (the Mastoid Vein,) also with the Veins of the Diploe.
 - 19 Externally in the Pericranial Veins, and internally in the Veins and Sinuses of the Dura Mater.
- CEREBRAL AND CEREBELLAR VEINS.
- 20 Into superficial and deep.
 - 21 On the Cerebral surface placed in the Sulci or Furrows formed by the convolutions of the Hemispheres.
 - 22 No; some run over the convexity of the convolutions.
 - 23 In the superior longitudinal Sinus.

- 24 In the Lateral Sinus on either side.
 25 Within the Ventricles of the Brain by the convergence of two Veins which form the Venæ Galeni.
 26 On the surface of the Corpus Striatum are observed several minute Veins which unite and form one Vein, called Vena Corporis Striati, which communicates with one of the Veins of the Choroid Plexus, and these on either side form together the two Venæ Galeni.
 27 In the straight Sinus.
 28 Like the Cerebral into a superficial and deep set.
 29 In the straight Sinus, also the Venæ Galeni.
 30 In the lateral and superior Petrosal Sinuses.

CEREBRAL SINUSES.

- 31 By the inner or Serous Lining of the Veins, and the Fibrous Layer of the Dura Mater, which latter does not extend beyond the base of the Skull.
 32 Into two sets—those situated within the prominent Folds of the Dura Mater, and those situated at the base of the Skull.
 33 The superior and inferior Longitudinal Sinuses, the Straight Sinus, the Occipital Sinus, and the Lateral Sinuses.
 34 From the Crista Galli of the Ethmoid Bone to the inner Tuberosity of the Occipital Bone, where it terminates in a dilatation called Torcular Herophili, which forms the Conflux of five or six Sinuses.
 35 Triangular, with its apex towards the front.
 36 The superficial Cerebral Veins, also numerous small Veins from the substance and exterior of the Skull (the Diploe, &c.)
 37 Chordæ Willisii.
 38 Glandulæ Pacchioni.
 39 In the lower concave border of the Falx Cerebri.
 40 From near the Crista Galli of the Ethmoid Bone to the edge of the Tentorium, where it opens in the Straight Sinus.
 41 Along the middle of the Tentorium, and appears to be the continuation of the inferior Longitudinal Sinus.
 42 Like the superior Longitudinal it is triangular.
 43 The Venæ Galeni and the superficial Cerebellar Veins.
 44 Along the attached border of the Falx Cerebelli.
 45 From the Foramen Magnum to the Conflux vel Torcular Herophili, into which it opens.

- 46 Yes.
- 47 From the Conflux at the internal Occipital Protuberance to the Foramina Lacera Posteriora, where they open one on either side into the internal Jugular Vein.
- 48 Those from the under surface of Cerebrum and Cerebellum, also the Occipital Vein, through the medium of the Mastoid Foramen (Mastoid Vein).
- 49 The superior and inferior Longitudinal Sinuses, the Straight and Occipital Sinuses, and the superior and inferior Petrosal Sinuses.
- 50 The Circular Sinus, Cavernous Sinus, superior Petrosal Sinus, inferior Petrosal Sinus, and the Transverse or Basilar Sinus.
- 51 Around the Pituitary Body, in the Sella Turcica.
- 52 The Cavernous Sinus on either side, and receives the Blood of the Pituitary Body through the medium of small Veins.
- 53 On either side of the Sella Turcica, by the side of the Body of the Sphenoid Bone.
- 54 The Ophthalmic Vein, which leaves the Orbit through the Sphenoidal Fissure, also some small Branches from the Pterygoid Veins exterior to the Skull, and some minute Veins from the under surface of the Cerebrum.
- 55 Through the medium of the Circular and Occipital or Transverse Sinuses.
- 56 Through the medium of the superior and inferior Petrosal Sinuses.
- 57 The internal Carotid Artery.
- 58 The third and fourth Nerves, and the Ophthalmic or Orbital division of the fifth.
- 59 From the Sphenoidal Fissure to the Tip of the Petrous Bone.
- 60 They present a Reticular or Cellular appearance, hence called Cavernous.
- 61 In a Depression or Groove in the upper border of the Petrous portion of the Temporal Bone.
- 62 The Cavernous and Lateral Sinus on either side.
- 63 One or two from the under surfaces of the Cerebrum and Cerebellum.
- 64 In a Groove or Depression formed by the Petrous portion of the Temporal Bone (its posterior border) with the Basilar Process of the Occipital Bone.

- 65 It forms the continuation backwards on either side of the Cavernous Sinus, and opens into the Lateral Sinus near its termination.
- 66 The Foramen Lacerum Medium.
- 67 This Sinus is situated at the anterior part of the Basilar Process, and establishes a communication between the inferior Petrosal and Cavernous Sinuses on either side.

SECTION XL.—VEINS OF THE NECK.

- 1 By the union of the Temporal and internal Maxillary Veins in the substance of the Parotid Gland.
- 2 It descends between the Sterno-mastoid and Platysma to the lower part of the Neck, where it pierces the deep Fascia to terminate in the Subclavian Vein, its course is best described by a line extending from the angle of the inferior Maxilla to a point midway between the Clavicle on either side.
- 3 Some superficial Branches (Venæ Cutanæ), also two large Veins—the Supra-scapular and the posterior Scapular.
- 4 By the convergence of small Veins from the Integument below the Chin on the anterior part of the Neck.
- 5 In the Subclavian Vein, near its union with the external Jugular.
- 6 By means of a Transverse Branch.
- 7 This Vein is continuous on either side with the Lateral Sinus.
- 8 From the Foramen Lacerum Posterius on either side the base of the Skull to the Sterno-clavicular Articulation.
- 9 In the Subclavian Vein at the Root of the Neck.
- 10 The Vena Innominata vel Brachio-cephalic Vein.
- 11 The Facial, Lingual, Occipital, the superior and middle Thyroid Veins, and Ascending Pharyngeal.
- 12 It is formed by small Radicles in the Pericranium and deep Muscles in the back of the Neck, and passes through the Aperture in the Atlas, also through the Apertures or Foramina in the Transverse Processes of the Cervical Vertebæ, where it emerges at the Root of the Neck, to terminate in the Subclavian Vein.
- 13 Superficial and deep Cervical Veins, internal and external Spinal Veins.

SECTION XLI.—VEINS OF THE TRUNK.

- 1 The superior Vena Cava, the inferior Vena Cava, the Spinal Veins, the Azygos Veins, the Cardiac Veins, the Pulmonary Veins, and the Vena Portæ.

VENA CAVA SUPERIOR.

- 2 By the union of the two Venæ Innominatæ.
- 3 To convey to the Heart the Blood from the Head, Neck, Upper Extremities, and Thorax.
- 4 It extends almost vertically opposite the space between the Cartilages of the two first Ribs on the right side to the Pericardium, the Fibrous Coat of which it pierces, to terminate in the upper part of the right Auricle.
- 5 The Thoracic Fascia.
- 6 The Root of the right Lung.
- 7 The ascending portion of the Aortic Arch.
- 8 The right Pleura and right Phrenic Nerve.
- 9 Some small Veins from the Pericardium and the Mediastinum, and, just before it pierces the Pericardium, it receives the larger Azygos Vein.
- 10 By the union of the internal Jugular & Subclavian Veins.
- 11 From the inner ends of the Clavicles to beneath the Cartilage of the first Rib on the right side.
- 12 Almost vertical, and nearly one-and-a-half inches in length.
- 13 Almost transverse, and nearly three inches in length.
- 14 The three large Vessels which arise from the Arch of the Aorta are anterior to it, viz: the Arteria Innominata, left Carotid, and left Subclavian Branches.
- 15 The inferior Thyroid, internal Mammary, and superior Intercostal.
- 16 Yes, some Thymic and Mediastinal Branches.
- 17 They are not provided with Valves.

VENA CAVA INFERIOR.

- 18 By the union or conflux of the two common Iliac Veins.
- 19 To convey to the Heart the Blood from the lower half of the Body, *i.e.* the Blood which has been circulated by the Abdominal Aorta.
- 20 From opposite the junction on the right side of the fourth and fifth Lumbar Vertebrae, ascending along the right side of the Aorta, it passes through the Groove in the posterior border of the Liver, and pierces the Diaphragm to reach the right Auricle of the Heart, in which it terminates.
- 21 These are Parietal and Visceral; the Parietal are—the Lumbar and middle Sacral; and the Visceral are—the right Spermatic, Renal, right Capsular, and the Hepatic.

- 22 No; they frequently open into the common Iliac Vein.
 23 Yes; they arise from the Ramusculi on the under surface of the Diaphragm.
 24 Just below the Renal Vein.
 25 Into the left Renal Vein.
 26 The Ovarian.
 27 The left.
 28 Because it crosses the Aorta, owing to the position of the Vena Cava Inferior.
 29 The right into the inferior Cava, and the left into the Renal Vein.
 30 Into the inferior Cava, whilst this Vessel is lodged in the Fissure appropriated to it in the posterior border of the Liver.
 31 They commence by a Plexus within each Lobule, which forms an Intralobular Vein, these unite and form the larger Veins, Sublobular; and these latter by their convergence ultimately form the Hepatic Veins, which terminate in the inferior Cava.

SPINAL VEINS.

- 32 Into Spinal and Intra-spinal—that is, those situated upon, and those within, the Spinal Column.
 33 Into the Petrosal Sinuses.
 34 Into three sets, viz: Meningo-rachidian, which form two anterior Longitudinal Vessels, which pass behind the bodies of the Vertebæ, on either side the posterior common Ligament, throughout the whole length of the Spinal Column, and communicate with the Vertebral Veins in the Neck, also those of the Dorsal Lumbar and Sacral Veins; a second set—Dorsi-spinal—form a Plexus between the outer Covering of the Cord and the Arches of the Vertebæ, this set opens into the anterior Longitudinal, Vertebral, Intercostal, Lumbar and Sacral Veins; and the third set—Medullis-spinal—form a Plexus which ultimately open into one Trunk, which divides into two Branches, which open one on either side into the large Longitudinal or Spinal Veins.

THE AZYGOS VEINS.

- 35 Two, and sometimes three, viz: one on the right side, called Vena Azygos Major; and one, and sometimes two, on the left side, Vena Azygos Minor vel Inferior and Vena Azygos Superior.

- 36 Generally from the Lumbar Veins on the right side of the Vertebral Column, opposite the second Lumbar Vertebra; sometimes it arises from the Renal Vein, or even the inferior Cava.
- 37 It enters the Thorax through the Aortic Opening of the Diaphragm, and ascends on the right side of the bodies of the Dorsal Vertebrae to opposite the third Dorsal Vertebra, where it passes forwards over the right Bronchus to terminate in the superior Vena Cava, just before this Vessel perforates the Pericardium.
- 38 The Thoracic Duct and Aorta.
- 39 The Intercostal Veins of the right side, the left Azygos Veins, some Œsophageal and Vertebral Veins, and the Bronchial Vein from the right Lung.
- 40 From one or more of the Lumbar Veins, sometimes from the left Renal Vein.
- 41 It passes with the Aorta into the Thorax, and ascends on the left side of the Spine as high as the sixth or seventh Dorsal Vertebra, where it crosses over to terminate in the larger Azygos Vein.
- 42 Five or six of the lower Intercostal Veins of the left side, and some Œsophageal Branches.
- 43 By small Branches derived from the superior Intercostal Vein and the upper Branch of the Vena Azygos Minor.
- 44 Sometimes in the Vena Azygos Major, and sometimes in the Vena Azygos Minor.

PULMONARY VEINS.

- 45 To return the Arterial Blood from the Lungs to the left Auricle.
- 46 They commence on the Bronchial Cells by minute Radicles, which are continuous with the minute Capillaries of the Arteries.
- 47 They pass behind the superior Vena Cava.
- 48 They pass behind the Pulmonary Artery.
- 49 Both sides pierce the Pericardium.
- 50 The Bronchial Tubes are placed before the Veins.
- 51 The Bronchial Tubes are the most posterior.
- 52 The Veins are the most anterior, the Bronchi most posterior, and, between the two, are the Arteries.
- 53 No.

CARDIAC VEINS.

- 54 The Great Cardiac or Coronary Vein, the anterior and posterior Cardiac Veins, and the Venæ Minimæ vel Venæ Thebesii.

- 55 In the substance of the Ventricles, near the Heart's apex.
- 56 In the Coronary Sinus.
- 57 Into the right Auricle.
- 58 Into the Coronary Vein.
- 59 From the substance of the anterior part of the right Ventricle.
- 60 From the substance of the posterior part of the Ventricles.
- 61 These minute Veins are situated over the surface of the organ.
- 62 Into the Auricles and Ventricles.

PORTAL VEIN.

- 63 By the junction of the Splenic and superior Mesenteric Veins.
- 64 It ascends from its point of union a little towards the right to reach the Transverse Fissure of the Liver, where it terminates by dividing into two Branches, one for either lateral Lobe, each of which ramifies through the Liver like an Artery.
- 65 The Excretory Duct and Hepatic Artery.
- 66 The Cystic Vein, and sometimes the Coronary Vein.
- 67 Superior Mesenteric, inferior Mesenteric, Splenic, and Coronary Veins.
- 68 By minute Radicles which receive the Venous Blood from the minute Radicles or Capillaries of the superior Mesenteric Artery.
- 69 By minute Radicles which receive the Venous Blood from the Capillaries of the inferior Mesenteric Artery.
- 70 It is formed by the union of five or six Branches which issue from the Fissure of the Spleen, and which ultimately form one Vein (the Splenic).
- 71 The Gastric Veins vel Vasa Brevia, the Pancreatic, Duodenal, and inferior Mesenteric.
- 72 In the Splenic Vein, and sometimes in the Trunk of the Portal Vein.
- 73 At the Pyloric Extremity.
- 74 By the Capillaries of the Hepatic Artery, within the substance of the Liver.

SECTION XLII.—VEINS OF THE UPPER
EXTREMITY.

- 1 Into two sets—the superficial and deep-seated.
- 2 They are Cutaneous, being situated beneath the Skin.
- 3 The Radial, Ulnar, Median, Median Basilic, Median Cephalic, the Basilic, and Cephalic Veins.

- 4 By Ramusculi on the Dorsal and outer Aspect of the Thumb and Index Finger.
- 5 It ascends along the outer border of the Wrist and Radial Border of the Forearm to the bend of the Elbow, where it gives rise to the Cephalic Vein, in which it terminates.
- 6 No; but from the external Branch of the Median Vein (Median Cephalic).
- 7 Two: an anterior and a posterior.
- 8 By Ramusculi on the anterior surface of the Wrist.
- 9 It ascends on the inner side of the Forearm to the bend of the Elbow, where it unites with the inner Branch of the Median (Median-basilic) to form the Basilic Vein.
- 10 By small Radicles or Ramusculi on the back of the Hand which unite to form a large Branch called Vena Salvatella.
- 11 From the fourth Metacarpal Space it ascends along the inner or Ulnar border and posterior Aspect of the of the Forearm to the bend of the Elbow, where it bends forward to terminate in the anterior Ulnar Vein.
- 12 By the union of several small Branches on the anterior and lower part of the Forearm.
- 13 It proceeds along the middle of the Forearm to near the Elbow, where it divides into two Branches—an internal and an external Branch, the former is called the Median Basilic Vein, and the latter the Median Cephalic Vein.
- 14 Yes; a Communicating Branch from one of the deep Veins beneath the Fascia.
- 15 From the point of division of the Median Vein its internal Branch passes obliquely inwards, across the Brachial Artery, between the Biceps and Pronator Radii Teres Muscles, and unites with the posterior Ulnar Vein to form the Basilic Vein on the inner border of the Arm.
- 16 From the point of division of the Median Vein its external Branch passes obliquely outwards, between the Biceps and Supinator Radii Longus, and unites with the Radial Vein to form the Cephalic Vein of the Arm.
- 17 This Vein is continuous with the common Ulnar Vein at the bend of the Elbow.
- 18 It ascends along the inner border of the Biceps Muscle to the middle of the Arm, and pierces the deep Fascia to reach the Axilla, where it terminates in the Axillary Vein.

- 19 The Brachial Artery.
- 20 Chiefly from the external division of the Median Vein, viz. the Median Cephalic.
- 21 It ascends to the Shoulder along the outer border of the Biceps Muscle, passing between the Pectoralis Major and Deltoid Muscles, and, beneath the Clavicle, terminates in the Axillary Vein.
- 22 The internal division of the Median Vein (Median Basilic).
DEEP-SEATED VEINS OF THE UPPER EXTREMITY.
- 23 The deep Ulnar Veins, the deep Radial Veins, the anterior and posterior Interosseous Veins, the Axillary and Subclavian Vein.
- 24 By the minute Radicles or Ramusculi of the deep Ulnar and Radial Veins.
- 25 They accompany the Brachial, Radial, and Ulnar Arteries in their Sheaths, also their several divisions.
- 26 In the deep Ulnar and Radial Veins; they also communicate with each other, and the posterior with the Ulnar Cutaneous Veins.

AXILLARY VEIN.

- 27 This Vein is continuous with the Basilic Vein of the Arm.
- 28 Yes; Thoracic, Subscapular, and opposite the Subscapularis Muscle, a Vein, formed by the Venæ Comites, opens into it (Brachial).
- 29 At the lower border of the first Rib, where it is continuous with the Subclavian Vein.

SUBCLAVIAN VEIN.

- 30 This Vein is continuous with the Axillary Vein.
- 31 From the lower border of the first Rib to the inner extremity of the Clavicle (its Sterno-clavicular Articulation.)
- 32 The internal Jugular Vein.
- 33 The Vena Innominata vel Brachio-cephalic.
- 34 The superior Vena Cava which has been already described.
- 35 The external and anterior Jugular above the Clavicle, and external to the Scalenus Muscle, sometimes the Cephalic opens into it below the Clavicle, and the Vertebral Vein terminates in the Subclavian on the inner side the Scalenus Muscle.
- 36 The right Lymphatic Duct.
- 37 The large or common Thoracic Duct.
- 38 The anterior Scalenus Muscle.
- 39 The Phrenic and Par-vagum.

SECTION XLIII.—VEINS OF THE LOWER
EXTREMITY.

- 1 Into two sets; superficial and deep-seated.
- 2 The external Saphenous Vein and the internal Saphenous Vein.
- 3 The internal Saphenous.
- 4 Superficial, and extends from the Dorsum of the Foot to the upper part of the Thigh (to within one inch-and-a-half of Poupart's Ligament.)
- 5 By a series of small Veins on the Dorsum and inner border of the Foot which form one large Trunk, viz., the internal Saphenous Vein.
- 6 It passes upwards in front of the inner Ankle and corresponding border of the Tibia, and at the Knee it ascends behind the inner Condyle and along the inner and anterior surface of the Thigh to the Fascia Lata or Saphenous opening, which it pierces to terminate in the Femoral or Crural Vein.
- 7 Several Cutaneous Branches, and near its termination the superficial Epigastric, Pudic, Circumflex Iliac, and deep communicating.
- 8 By a series of small Veins which form a Plexus on the Dorsum and outer border of the Foot.
- 9 It passes behind the outer Malleolus to the back of the Leg along which it ascends between the two heads of the Gastrocnemius Muscle to the Popliteal Region, where it pierces the Fascia to terminate in the Popliteal Vein.
- 10 Yes; several Cutaneous Branches.
- 11 The external Saphenous Nerve.

DEEP-SEATED VEINS OF THE LOWER EXTREMITY.

POPLITEAL VEIN.

- 12 By the union of the Venæ Comites which accompany the Arteries of the Leg viz., the anterior and posterior Tibial and Peroneal Arteries.
- 13 From the lower border of the Popliteus Muscle it passes upwards between the two heads of the Gastrocnemius to the Popliteal Region, and enters the Aperture in the Adductor Magnus where it terminates in the Femoral Vein.
- 14 Yes; some Branches from the Articular and Muscular Vessels, also the external or short Saphenous Vein.
- 15 The Vein is the most external.

FEMORAL VEIN.

- 16 This Vein is continuous with the Popliteal Vein.
- 17 From the Aperture in the Adductor Magnus Muscle to the Poupart's Ligament, where it terminates in the external Iliac Vein.
- 18 The Vein is situated on the inner side.
- 19 The Vein is situated on the outer side.
- 20 Yes; in the lower part it receives the Venous Branches which correspond to the ramifications of the Arteries, in the upper part the Profunda Vein, and near its termination it receives through its Saphenous opening the internal or long Saphenous Vein.
- 21 Four, and sometimes five.

PROFUNDA VEIN.

- 22 By the union of the numerous Venous Branches which accompany those of the Profunda Artery.
- 23 Into the Femoral Vein about one inch-and-a-half below its termination.

EXTERNAL ILIAC VEIN.

- 24 This Vein is continuous with the Femoral Vein.
- 25 Opposite the Sacro-iliac Symphysis where it unites with the internal Iliac Vein to form the common Iliac Vein.
- 26 Yes; near its commencement it receives the Epigastric and circumflex Iliac Veins.

INTERNAL ILIAC VEIN.

- 27 By the union of the Vessels which correspond to, and accompany, the Venous Branches of the internal Iliac Artery.
- 28 It lies in front of the Sacro-iliac Junction and passes upwards to the margin of the Pelvis where it terminates in the external Iliac Vein.
- 29 Yes; external to the Pelvis it receives the Gluteal, Sciatic, Pudic, Dorsalis Penis, and Obturator Veins, and within the Pelvis the Vesical, Prostatic, Uterine and Vaginal Plexuses.
- 30 Into the Dorsal Vein of the Penis.

COMMON ILIAC VEIN.

- 31 By the union or conflux of the internal and external Iliac Vein on either side of the Pelvis.
- 32 From the point of union it passes upwards to the right side to unite with its fellow at the junction of the fourth and fifth Lumbar Vertebrae where it terminates in the Vena Cava inferior.
- 33 The left.

- 34 Yes; the Venous Branches which correspond to the Ilio-lumbar and Lateral Sacral Arteries.
 35 The middle Sacral Vein.

SECTION XLIV.—ABSORBENT SYSTEM.

- 1 The Absorbents or Lymphatics are a numerous set of small transparent Vessels which collect the nutritive parts or products of our food, also the various fluids and solids of the Body (so as to allow a fresh deposit *i. e.* to be replaced by that which is newly formed) and convey them into the Venous Current of the circulation.
- 2 These small delicate Vessels present a nodular or knotted appearance.
- 3 To every part of our Frame.
- 4 Glands vel Ganglia.
- 5 Into two sets, viz., Lacteals and Lymphatics.

LACTEALS.

- 6 The Absorbents of the small Intestines.
- 7 The only distinction arises from the colour of their contents, the Lacteals convey a milk-like fluid. the product of digestion, called Chyle, to the Receptaculum Chyli or Lacteal Sac.
- 8 Between the two Layers of the Mesentery near the lower part of the Spinal Column.
- 9 The Mesenteric Glands.

LYMPHATICS.

- 10 They commence by minute open mouths forming a reticular appearance throughout the whole cutaneous surface of the Body, from all the various surfaces of Organs and their internal structure, as the Lungs, Heart, Stomach, Liver, Gall-bladder, Intestines, &c., also the Cellular Tissue, Ducts, &c., &c.
- 11 From this Plexiform arrangement they proceed towards the Root of the Neck where they ultimately terminate by two Trunks which open into the angle of union formed by the Subclavian and internal Jugular Veins.
- 12 The Thoracic Duct and the right Lymphatic Duct.
- 13 Into two sets, a superficial and deep set; each following the arrangement or course of the Veins.

THORACIC DUCT.

- 14 The great Tube through which the Lymphatic and Chyliferous Fluid from the lower half of the Body, and that of the left side of the upper half of the Body is conveyed into the Venous current of the circulation.

- 15 It commences in the Abdomen by a triangular enlargement (Receptaculum Chyli) and terminates in the angle of union formed by the left Subclavian and left internal Jugular Veins.
- 16 About 18 inches in length, and extends from opposite the Body of the second Lumbar Vertebra through the Aortic opening in the Diaphragm between the Aorta and Vena Azygos, when opposite the second Dorsal Vertebra it passes beneath the Aortic Arch to the left side of Oesophagus along which it ascends to the Root or lower part of the Neck, corresponding to the seventh or sixth Cervical Vertebra.
- 17 At its upper part.
- 18 Yes; but extremely rare.
- 19 No, it often Bifurcates opposite the seventh or eighth Dorsal Vertebra, but soon re-unites.
- 20 By two Semilunar Valves.
- 21 At its commencement it receives four or five Lymphatic Vessels which unite into one Cavity the Receptaculum Chyli, it also receives the Chyliferous Trunks, and in the Thorax it receives the Lymphatic Vessels of its Parietes (*i.e.* those from the Sternal and Intercostal Glands), and those of its Viscera, as the Lungs, the Heart; lastly, it receives the Lymphatics from the left side of the Head and Neck, left Upper Extremity, Trachea, and Oesophagus.
- 22 It is situated on the right of the Aorta.
- RIGHT LYMPHATIC DUCT.
- 23 By the union of the Lymphatic Vessels from the right Upper Extremity, and the corresponding side of the Head and Thorax.
- 24 About three-quarters of an inch in length, and opens in the angle of union of the right Subclavian and the right internal Jugular Veins.
- 25 By two Semilunar Valves.
- LYMPHATIC GLANDS.
- 26 Small oval or somewhat rounded bodies, through which the Absorbent Vessels convey their contents, ere they terminate in the common Trunks.
- 27 In various parts of the Body, *e.g.* below the Occiput, behind the Ears, below the Maxilla, side of the Neck, behind the Clavicle, in the Axilla, near the Elbow, in the Thorax, in the Abdomen, in the Inguinal Region, Pelvis, Popliteal Region, &c., &c.

- 28 Vasa Inferentia.
 29 Vasa Efferentia.
 30 The Vasa Inferentia.
 31 They appear to be composed of convoluted Lymphatic Ramusculi forming, with the Blood-vessels ramifying in the midst of these convolutions, a Plexus, which is enclosed in a Cellular Structure.
 32 They are composed of two Coats: an external, analogous to that of the Blood-vessels; and an internal or Serous Coat, which is continuous with that of the Veins.
 33 Valves.
 34 Like the Veins, into four sets or groups, viz: those of the Head and Neck, those of the Trunk, those of the Upper Extremity, and those of the Lower Extremity.

SECTION XLV.—LYMPHATICS OF THE HEAD AND NECK.

- 1 Into two sets: a superficial and a deep.
 2 The Occipital, Temporal, and Facial.
 3 The Meningeal and Cerebral; those of the Face pass from the Nasal Fossæ, Mouth, and Pharynx.
 4 Occipital, posterior Auricular, Parotid, Submaxillary.
 5 In the Thoracic and right Lymphatic Ducts.
 6 Some accompany the external Jugular Vein, others are situated along the base of the inferior Maxilla on either side.
 7 They accompany the internal Jugular Vein, Carotid Artery, Pharynx, Œsophagus, and Trachea.

SECTION XLVI.—LYMPHATICS OF THE THORAX, ABDOMEN, AND PELVIS; OR TRUNK.

- 1 Yes.
 2 Into two sets—superficial and deep, which are distributed throughout the surface and texture of these Organs.
 3 They accompany the Coronary Vessels.
 4 In the Thoracic and right Lymphatic Ducts.
 5 The Sternal, Intercostal, Œsophageal, Cardiac, Bronchial.
 6 Yes.
 7 In the Renal Lymphatics.
 8 Into the Inguinal Glands.
 9 Through the special Aperture in the Fascia Lata of the Thigh, the Saphenous opening, (Foramen Saphenum)
 10 Into the Mesenteric Glands.

- 11 Into the Lumbar Lymphatic Glands.
- 12 Into the Lumbar Lymphatic Glands.
- 13 Those of the lower extremity, Viscera and Parietes of the Abdomen, (through the Inguinal Glands) those of the Genital Organs.
- 14 Whilst diminishing in number they increase in size, until they ultimately form three or four large Lymphatic Vessels which form the central receptacle of the common Thoracic Duct (Receptaculum Chyli.)

SECTION XLVII.—LYMPHATICS OF THE UPPER EXTREMITY.

- 1 Into two sets, superficial and deep.
- 2 They accompany the large Cutaneous Veins.
- 3 They follow the course of the deep Vessels, viz., Radial, Ulnar, and Brachial Arteries.
- 4 In the Axillary and Subclavian Glands.
- 5 Like the preceding, in the Axillary and Subclavian Glands.
- 6 In the Thoracic and right Lymphatic Ducts.
- 7 Into two sets, superficial and deep.
- 8 These Glands four or five in number, are situated about the bend of the Elbow near the Cephalic and Median Basilic Veins.
- 9 Near the Radial and Ulnar Vessels, and in the upper Arm several accompany the Brachial Artery.
- 10 In the lower and posterior parts of the Axilla, varying from eight to ten or twelve in number.
- 11 The Lymphatics of the Arm, anterior part of the Thorax from the Integuments on the posterior part of the Back, and some of the Mammary Lymphatics.
- 12 A Trunk which opens into the corresponding Duct of the same side.

SECTION XLVIII.—LYMPHATICS OF THE LOWER EXTREMITY.

- 1 Into two sets, superficial and deep-seated.
- 2 These Vessels are divided into two sets, an internal and an external, the former are the most numerous, commencing on the Dorsum and inner border of the Foot, accompanying the long Saphenous Vein, and terminate in the superficial Inguinal Glands; the latter accompany the external or short Saphenous Vein, and terminate in the Lymphatic Glands of the Popliteal space.

- 3 They accompany the deep Vessels of the lower extremity, and join the various Lymphatic Glands in their course.
- 4 Into two sets, an upper and a lower, the former situated over the line of Poupart's Ligament, and the latter about the Saphenous opening of the Fascia Lata.
- 5 Lymphatics from the Abdomen and superficial parts of the Genital Organs, and superficial Lymphatics of the lower extremity.
- 6 The anterior and posterior Tibial, Peroneal, Popliteal, Gluteal, &c.

SECTION XLIX.—THE NERVOUS SYSTEM.

- 1 Into two parts, the Cerebro-Spinal and the Sympathetic.
- THE BRAIN AND ITS COVERINGS.
- 2 The Cerebrum, Cerebellum, Pons Varolii, Medulla Oblongata and Membranes together constitute the Encephalon.
 - 3 The largest part of the Encephalon, and consists of two Hemispheres which are partly separated by the great longitudinal Fissure.
 - 4 Its upper surface is convex and its lower irregular, the latter divided into three Lobes.
 - 5 Into an anterior, a middle, and a posterior Lobe.
 - 6 Triangular, and rests on the Orbital Plate of the Os Frontis.
 - 7 The first Cranial Nerve, (Olfactory).
 - 8 It is situated in the middle Fossa of the base of the Skull.
 - 9 A portion of the Dura Mater called Tentorium Cerebelli.
 - 10 This surface is marked by Tortuous Eminences, called Convolutiones vel Gyri.
 - 11 The Sulci or Afractuosities of the Brain.
 - 12 Two substances; an external, called the grey, Cortical, or Cineritious substance; and an internal, called the white, or Medullary substance.
 - 13 This substance forms the thin Lamella over the Convolutiones and dips down into the Afractuosities.
 - 14 Of a milk-white hue, and constitutes the internal Cerebral mass.
 - 15 Into two sets, according to some Anatomists, Diverging and Converging; and into three according to others, Diverging, Transverse, and Longitudinal.
 - 16 They proceed from the three divisions of the Medulla-oblongata to every part of the Cerebral surface.
 - 17 The anterior Pyramid, the lateral Tract or Column, and the Restiform Body.

- 18 Upon the Periphery or surface of each Hemisphere, and pass inwards towards the centre so as to unite the Diverging Fibres of each Cerebral mass.

BASE OF THE CEREBRUM.

- 19 Longitudinal Fissure, first pair of Cerebral Nerves, Fissure of Sylvius, part of the Transverse Fissure, Optic Commissure, Tuber Cinereum, Infundibulum, Corpora Mammillaria, Locus Perforatus vel Pons Tarini, Peduncles of the Brain, Pons Varolii, Peduncles of the Cerebellum and the Medulla Oblongata.
- 20 The space which separates the two Hemispheres of the Brain.
- 21 The Olfactory Nerve, which will be described with the Cerebral Nerves.
- 22 On the Olivary process of the Sphenoid Bone, anterior to the Tuber Cinereum.
- 23 It forms the medium of communication between the second pair of Cerebral Nerves.

FISSURE OF SYLVIVS.

- 24 The anterior from the middle Lobe.
- 25 The middle Cerebral Artery, which is one of the terminal Branches of the internal Carotid Artery.
- 26 Outwards, and divides externally into two parts.
- 27 A cluster of five or six small Convolutions called the Island of Reil.
- 28 Substantia Perforata vel Lamina Cribrosa.
- 29 Because it is pierced by several Foramina for the transmission of small Vessels.
- 30 This mass of Grey Matter is situated behind the Optic Commissure and forms, by its superior surface, part of the floor of the third Ventricle.
- 31 A funnel-shaped process of Grey Matter which projects from the centre of the inferior surface of the Tuber Cinereum.
- 32 The Pituitary Gland.
- 33 In the depression in the centre of the Sphenoid Bone, called Sella Turcica—its use is unknown.
- 34 Two Lobes, an anterior and a posterior, of which the former is the largest, each contains a peculiar substance which is neither Cerebral nor Glandular.
- 35 Two small whitish Bodies, about the size of peas, situated just behind the Tuber Cinereum.
- 36 The anterior Pillars or Crura of the Fornix.
- 37 Locus Perforatus vel Pons Tarini; a thin triangular

Lamella of whitish grey Matter situated behind the Corpora Albicantia and between the Peduncles or Crura of the Cerebrum.

- 38 Part of the floor of the third Ventricle.
 39 Two large white Cords situated near the centre of the base of the Brain, extending forwards and upwards from the Pons Varolii to the under surface of the Cerebral Hemisphere of the corresponding side, where they appear as if inserted.
 40 Locus Perforatus, Tuber Cinereum, and Corpora Piformia.
 The Motor Oculi.

PONS VAROLII.

- 41 That large Band of white Fibres which is situated across the upper part of the Medulla Oblongata, and between the Hemispheres of the Cerebellum.
 42 The Basilar Artery.
 43 The sixth and seventh Cranial Nerves.
 44 The Pons Varolii.
 45 It consists of alternate strata of transverse and longitudinal Fibres.
 46 Those of the Crura Cerebelli, which they form.
 47 Those of the Medulla Oblongata.
 48 Square, and nearly two inches in width.

MEDULLA OBLONGATA.

- 49 The upper enlarged part of the Spinal Cord within the Cranium.
 50 From the lower border of the Pons Varolii to the level of the upper border of the Atlas.
 51 Pyramidal; nearly one inch-and-a-half in length; about three-quarters of an inch in breadth; and half-an-inch in thickness.
 52 The Median Sulcus (anterior and posterior Sulcus).
 53 Base and apex.
 54 The base, and united to the Pons Varolii.
 55 The former is convex and rounded, and the latter slightly hollowed.
 56 The Basilar Process of the Os Occipitis.
 57 The Floor of the fourth Ventricle.
 58 Three segments or divisions of the Spinal Cord, viz: anterior Pyramid, lateral Tract or Column, and the Restiform Body.

ANTERIOR PYRAMID.

- 59 The anterior Pyramid is situated at the middle line of

- the anterior surface of the Medulla Oblongata.
- 60 The anterior Sulcus or Median Fissure.
- 61 The Decussating Fibres from either side.
- 62 From the lower border of the Pons Varolii to the Foramen Magnum.
- 63 The Olivary Body (Corpus Olivare.)
- 64 A shallow Groove.
- 65 An arborescent appearance.
- 66 The posterior Pyramid at either side forms at the posterior Median Sulcus the continuation of the Spinal Cord.
- CORPORA RESTIFORMIA.
- 67 The Corpus Restiforme on either side forms the posterior segment or Column of the Medulla Oblongata.
- 68 Above, with the Pons Varolii; and below, with the posterior Column of the Spinal Cord.
- 69 The Cavity of the fourth Ventricle.
- 70 In a Sulcus between the Corpus Olivare et Restiforme on either side the Medulla Oblongata, and called the Respiratory Tract.
- 71 Pathetic, Facial, and Glosso-pharyngeal.
- CORPUS CALLOSUM.
- 72 Commissures.
- 73 The Great Commissure of the two Hemispheres (Commissura Magna Cerebri).
- 74 This somewhat oblong white body forms the middle portion of the Centrum Ovale Majus, which is best seen after both Hemispheres have been sliced to the level of the Corpus Callosum.
- 75 The Roofs of the lateral Ventricles.
- 76 About three inches and a half, and approaches nearer the anterior than the posterior part of the Brain.
- 77 In a rounded border, which is prolonged downwards and backwards to the base of the Brain.
- 78 It is continuous with the Fornix.
- 79 The Raphe.
- CENTRUM OVALE MAJUS ET MINUS.
- 80 By slicing a portion of either Hemisphere a little above the level of the Corpus Callosum, a white central substance of an oval form will present itself (surrounded by a margin of grey matter), this is the Centrum Ovale Minus; this divided surface, in a fresh subject, will be studded with numerous dots or spots of Blood, arising from the division of the minute Vessels.

- 81 By slicing a portion of either Hemisphere to the level of the Corpus Callosum, a larger white central substance will present itself (also surrounded by a margin of grey matter), this is the Centrum Ovale Majus.

FORNIX.

- 82 The thin triangular and horizontal Lamella of white matter situated beneath the Corpus Callosum.
 83 Part of the Floor of the lateral Ventricles.
 84 In two Crura or Pillars, which arch downwards at the forepart of the lateral Ventricle, to terminate in the Corpora Pisiformia.
 85 Each forms a narrow white or Medullary Band, called Corpus Fimbriatum (Tænia Hippocampi).
 86 Fascia Dentata.
 87 Hippocampus Major et Minor.
 88 Lyra.
 89 Foramen of Munro.

SEPTUM LUCIDUM.

- 90 The thin semi-transparent partition between the lateral Ventricles.
 91 Two thin Layers of white Cerebral Matter.
 92 The fifth Ventricle.
 93 This white cord-like Fasciculus, which passes through the Corpus Striatum on either side, connects the two Hemispheres (the anterior and middle Lobes.)
 94 This layer of Grey Matter connects the corresponding sides of the two Optic Thalami.
 95 This white cord-like Fasciculus connects the two Optic Thalami posteriorly.
 96 Foramen Commune Anterius.
 97 Iter ad Infundibulum.
 98 Foramen Commune Posterius.
 99 Iter a Tertio ad Quartum Ventrículum.

SECTION L.—VENTRICLES OF THE BRAIN, &c.

- 1 The Lateral, third, fourth, and fifth Ventricles.
- 2 Beneath the Corpus Callosum, one in each Hemisphere.
- 3 From one extremity of the Hemisphere to the other, in the three Lobes of each.
- 4 Into a Central part and three smaller, called Cornua; anterior, posterior, and inferior.
- 5 Somewhat triangular.
- 6 Forward and outward into the anterior Lobe of the Brain.
- 7 Backward and inward to the posterior Lobe, converging

towards the one of the opposite Hemisphere.

- 8 It descends in a curved manner into the middle Lobe.
- 9 By the Corpus Callosum which forms its Roof.
- 10 By the Septum Lucidum.
- 11 By the Corpus Striatum, Tænia Semicircularis, Optic Thalamus, and part of the Fornix.

CORPUS STRIATUM.

- 12 At the bottom of the anterior part of each Lateral Ventricle.
- 13 Pyriform.
- 14 Grey.
- 15 Because grey and white Fibres are so intermingled in the interior as to produce this Striated appearance.
- 16 The Corpora Striata.

TÆNIA SEMICIRCULARIS.

- 17 A thin Fasciculus of white longitudinal Fibres which lie between the Optic Thalamus and Corpus Striatum.
- 18 The Crus of the Fornix.
- 19 The Roof of the middle or descending Cornu of the Lateral Ventricle.

OPTIC THALAMUS.

- 20 Behind and between the posterior extremities of the Corpora Striata.
- 21 The Root of the Optic Nerve.
- 22 By the middle or soft Commissure.
- 23 Two rounded Papillæ; Corpus Geniculatum externum et internum.
- 24 The external.
- 25 The Thalami Optici.

HIPPOCAMPUS MAJOR.

- 26 The Medullary protuberance situated in the floor of the middle or descending Cornu of each Lateral Ventricle.
- 27 It is curved, with its Convex Border directed outwards following the course of the cavity in which it lies.
- 28 This extremity has been likened to the foot of a carnivorous animal from the circumstance of its presenting three or four elevations separated by corresponding depressions, hence its designation, Pes Hippocampi.
- 29 A small white elevation situated on the outer wall of the Cornu.

HIPPOCAMPUS MINOR.

- 30 A small Medullary elevation situated in the floor of the Digital Cavity or posterior Cornu of each Lateral Ventricle.

TRANSVERSE FISSURE OF THE CEREBRUM.

- 31 Beneath the Fornix.
 32 Passing downwards between the Hemispheres and Peduncles of the Brain, it extends from the transverse Fissure of Sylvius on one side to that on the opposite side.

33 The Pia Mater.

34 The Velum Interpositum and Choroid Plexus.

VELUM INTERPOSITUM.

- 35 A Fold or reflection of the Pia Mater.
 36 Triangular and the same extent as the Body of the Fornix.
 37 The Choroid Plexus.
 38 Two large Veins, Venæ Galeni.
 39 They unite posteriorly into one, which opens into the straight Sinus.

CHOROID PLEXUS.

- 40 The fringed margin of the Pia Mater, which extends across the floor of each Lateral Ventricle.
 41 Through the Foramen of Munro.

THIRD VENTRICLE.

- 42 The third Ventricle is the space between the Thalami Nervorum Opticorum in the middle line of the Cerebrum.
 43 By the under surface of the Velum Interpositum.
 44 By parts of the base of the Brain situated between the anterior longitudinal Fissure and Peduncles of the Brain, viz., the Optic Commissure, Locus Perforatus, Corpora Pisiformia, and Tuber Cinereum.
 45 By the Optic Thalami.
 46 By the anterior Commissure of the Brain and descending Pillars of the Fornix.

47 By the posterior Commissure of the Brain.

48 All the other Ventricles of the Brain.

49 Through the Foramen of Munro on either side.

50 Through the Aqueduct of Sylvius vel Iter a Tertio ad Quartum Ventriculum.

51 In the Adult it is closed.

52 Inferiorly, between the Crura of the Fornix.

CORPORA QUADRIGEMINA.

53 Four whitish rounded bodies arranged in pairs, situated behind the third Ventricle and upon the posterior surface of the Pons Varolii.

54 The upper or anterior, which are the largest, are called Nates; and the lower or posterior, Testes.

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- 55 The third and fourth Ventricles, and called the Aqueduct of Sylvius.
 56 The Pineal Gland.

PINEAL GLAND.

- 57 A small reddish-brown coloured conical body, about two lines in length, with its base directed forward.
 58 Several light-brown coloured Granules, which contain Calcareous matter (Carbonate and Phosphate of Lime).
 59 By means of two white or Medullary Cords, called the Peduncles of the Pineal Body.
 60 The posterior Commissure of the Cerebrum, which is connected with the base of the Gland by transverse Medullary Fibres.

FOURTH VENTRICLE.

- 61 Beneath the Cerebellum, on the dorsal or posterior surfaces of the Medulla Oblongata and Pons Varolii, which form its Floor.
 62 By the Valve of Vieussens and under part of the Processus Vermiformis.
 63 By Lobes of the Cerebellum (its superior and inferior Peduncles).
 64 Calamus Scriptorius, Choroid Plexus, and the Lineæ Transversæ.
 65 The Groove on the anterior or lower half of the Floor of the fourth Ventricle, of a somewhat triangular form.
 66 From its resemblance to a pen.
 67 Yes; but smaller.
 68 By a Fold of the Pia Mater.
 69 From the inferior Cerebellar Artery.
 70 These irregular transverse lines, which somewhat resemble the plume of a feather, are situated on the anterior Floor of the fourth Ventricle.

FIFTH VENTRICLE.

- 71 Between the two thin Lamellæ of which the Septum Lucidum is composed.
 72 In the anterior part.

LINING MEMBRANE OF THE VENTRICLES.

- 73 Serous.
 74 No communication exists between them.

SECTION LI.—CEREBELLUM.

- 1 In the inferior Cavity of the Cranium, *i.e.* in the posterior Fossæ, beneath the Tentorium Cerebelli,
 About four inches in width, broader laterally than

- before or behind, and flattened from above downwards.
- 3 Like the Cerebrum, into two Hemispheres.
 - 4 This surface is not marked with Convulsions, but by parallel Laminae, which are separated by Sulci or Fissures.
 - 5 Convex.
 - 6 Like the Cerebrum, it consists of two substances—an external or Cortical, and an internal or Medullary substance.
 - 7 By making a vertical section of the Cerebellum, the Medullary or white substance within the Cortical would present the appearance of a tree with numerous Branches, hence the designation “Arbor Vitæ.”
 - 8 By a Fissure or Sulcus, which lodges the Falx Cerebelli.
 - 9 By two Projections, formed by the Vermiform Processes.
 - 10 The superior Vermiform Process.
 - 11 Along the middle line, and acting as the superior Commissure, serves to connect the two Hemispheres.
 - 12 The inferior Vermiform Process, which serves to connect the two Hemispheres on the under surface.
 - 13 The Uvula, Nodule, Tonsil, and Pyramid or Flocculus.
 - 14 By three pairs or Peduncles of Medullary Fasciculi.
 - 15 Processus e Cerebello ad Testes, Corpora Restiformia, and Crura Cerebelli.

PROCESSUS E CEREBELLO AD TESTES.

- 16 The superior Peduncles of the Cerebellum.
- 17 Each is continuous with the inferior Vermiform Process behind, and terminate in the Optic Thalamus and Crus Cerebri of each Hemisphere.
- 18 The Valve of Vieussens.
- 19 Part of the lateral boundaries of the fourth Ventricle.

CORPORA RESTIFORMIA.

- 20 The inferior Peduncles of the Cerebellum, and form here only part of the Corpora Restiformia.
- 21 The Medulla Oblongata with the Cerebellum.

CRURA CEREBELLI.

- 22 The middle Peduncles of the Cerebellum.
- 23 The terminal transverse Fibres of the Pons Varolii or Great Commissure of the Cerebellum.
- 24 In the lateral parts of the Cerebellum, and pass forwards to the Pons Varolii, where they form the Transverse Fibres.

SECTION LII.—COVERINGS OF THE BRAIN.

- 1 Dura Mater, Pia Mater, and Arachnoid Membrane.
- 2 The Dura Mater.

DURA MATER.

- 3 The strong fibrous Membrane which lines the inside of the Skull and Spinal Column, and separates and supports various portions of the Brain by means of Duplicatures or Processes.
- 4 It consists of two Laminae: an external white Fibrous Layer, and an internal Special or Serous Layer.
- 5 Rough, and corresponds with the inner surface of the Cranium, to which it is very adherent.
- 6 Smooth, polished, and lubricated.
- 7 Small whitish granular bodies.
- 8 Along the middle line on the internal surface of the Dura Mater.
- 9 Yes.
- 10 The Venous Channels of the Brain, which have been already described in the Section on the Veins.
- 11 Falx Cerebri, Tentorium Cerebelli, and Falx Cerebelli.
- 12 This Process forms a partition along the upper and middle line, extending from the edge or Process of the Crista Galli of the Ethmoid Bone in front to the Tentorium Cerebelli behind, to both of which it is attached.
- 13 That of a sickle, with the broadest part or basis turned backwards.
- 14 It passes between the Hemispheres, and supports either in the various positions of the Head.
- 15 The superior and inferior Longitudinal and Straight Sinuses.

TENTORIUM CEREBELLI.

- 16 That portion of the Dura Mater which is stretched across the posterior part of the Cavity of the Cranium, between the posterior under surface of the Cerebrum and upper surface of the Cerebellum.
- 17 On either side to the angles of the Petrous Bone; behind, to the transverse ridge of the Os Occipitis; and in front, to the Clinoid Processes of the Sphenoid Bone.
- 18 The Straight Sinus.
- 19 The lateral and superior Petrosal Sinuses.
- 20 Its middle, which joins the Falx Cerebri. The Cerebrum from the Cerebellum, and supports the posterior Lobes of the former.

- 22 Oval.
 23 Parts which join the Cerebrum and Cerebellum, *e.g.*
 Crura Cerebri, Processus e Cerebello ad Testes.

FALX CEREBELLI.

- 24 Between the Lobes of the Cerebellum.
 25 It descends from the middle of the under surface of the Tentorium, along the vertical ridge of the Os Occipitis to the Foramen Magnum.
 26 The Hemispheres or Lobes of the Cerebellum.
 27 Triangular, with its base directed to the Tentorium Cerebelli and its apex downwards.
 28 The Occipital Sinuses.

ARTERIES AND NERVES OF THE DURA MATER.

- 29 Into anterior, middle and posterior Meningeal.
 30 From the Ethmoidal Branches of the Ophthalmic, which last-named Artery is derived from the internal Carotid.
 31 The Dura Mater at the base of the Skull, near the Ethmoid Bone.
 32 Two of these Branches are derived from the internal Maxillary, which last-named Artery is derived from the external Carotid, and the third is derived from the ascending Pharyngeal, also a Branch of the external Carotid.
 33 The last of these three Branches supplies the Dura Mater in the middle Fossa, and the Dura Mater on the upper surface and sides are also supplied by the larger of these middle Meningeal Branches.
 34 From the Occipital and Vertebral Arteries; the former derived from the external Carotid, and the latter from the Subclavian Artery.
 35 The Dura Mater in the posterior Fossæ of the Os Occipitis.
 36 Their source is somewhat irregular; Branches are derived from the Sympathetic, also from some of the Cranial Nerves, viz: the Ophthalmic or fifth, and sometimes from the Pathetic or fourth Nerve.

PIA MATER.

- 37 The Vascular Membrane which surrounds and closely invests the Cerebral Mass, passing into its Fissures and Depressions.
 38 Yes; forming the Velum Interpositum and Choroid Plexuses.
 39 It presents, from its extreme Vascularity, a net-work of Blood-vessels, which are held together by a thin Layer of Cellular Tissue.

- 40 By the Ramusculi of the Cerebral Arteries and Veins.
- 41 By the Pia-mater; the inner or Visceral Surface giving off the minute Nutritive Vessels.
- 42 From the two internal Carotid and two Vertebral Arteries.
- 43 From the minute Offsets of the Sympathetic; and it is conjectured by one or two Anatomists that some Cranial Nerves furnish minute Filaments to it.

ARACHNOID MEMBRANE.

- 44 The fine Serous Membrane which not only lines the Brain, but is also reflected over the inner surface of the Dura Mater.
- 45 Into two parts : an external or Parietal and an internal or Visceral.
- 46 The Dura Mater and its Processes, to which it is inseparably connected.
- 47 The Encephalon, to which it is loosely connected by Cellular Tissue.
- 48 The Sub-arachnoidean Space.
- 49 No; but passes over them.
- 50 It is closely united posteriorly with the Pons Varolii and inferior surface of the Cerebellum.
- 51 The Sub-arachnoidean Fluid.
- 52 It is almost extra-vascular.
- 53 If present they have hitherto eluded, by the aid of the Microscope, the researches of the Anatomist.

SECTION LIII.—SPINAL CORD.

- 1 That portion of the Cerebro-spinal Mass which is enclosed in the Vertebral Canal.
- 2 From the lower border of the Pons Varolii, opposite the level of the Atlas, to the upper border of the second Lumbar Vertebra.
- 3 From sixteen to eighteen inches in length, and somewhat cylindrical.
- 4 No; but presents in its extent two enlargements, corresponding to the origin of the Spinal Nerves; the first or upper one opposite the last three or four Cervical Vertebrae, and the other opposite the last two Dorsal Vertebrae.
- 5 Yes; in the upper, the Cord is wider from side to side than before backwards, and vice-versa with the lower enlargement.
- 6 A Median Longitudinal Fissure, which divides each surface into two lateral halves.

- 7 The anterior Longitudinal Fissure.
- 8 About one-third of the thickness of the Cord.
- 9 By transverse Fibres of Medullary Matter, which constitute the anterior Commissure.
- 10 The posterior.
- 11 By Fibres of Grey Matter which pass into the interior of the Cord.
- 12 By the transverse Fibres of White Matter which constitute the anterior Commissure.
- 13 Two lateral Fissures (anterior and posterior).
- 14 The attachment of the Fibrils of the anterior and posterior Roots of the Spinal Nerves.
- 15 The posterior lateral Fissure.
- 16 In the Grey Matter in the interior of the Cord.
- 17 Four: the anterior, lateral, posterior, and posterior Median Columns.
- 18 The Motor Columns, which give origin to the anterior Roots of the Spinal Nerves.
- 19 Corpora Pyramidalia.
- 20 The Sensory Columns which give origin to the posterior Roots of the Spinal Nerves.
- 21 Corpora Restiformia.
- 22 Yes (Ellis) and gives attachment to the anterior or Motor Roots.
- 23 In the Medulla Oblongata.
- 24 Unknown.
- 25 At the upper part.
- 26 The Median posterior Column.
- 27 Variously: sometimes in a rounded point a few lines below the Lumbar Enlargement, sometimes in a small Bulb slightly constricted at its centre (Gall and Spurzheim), but its termination is only a secondary consideration, as it does not give attachment to any Nerve.
- 28 By the continuation of the three Membranes which invest the Brain.

DURA MATER.

- 29 It is only loosely attached to the Cord.
- 30 It forms a Sheath to the upper part of the Sacrum, and from thence it is continued as an impervious Cord to the Coccyx, under the old name of Cauda Equina.
- 31 That in the Neck and Loins.
- 32 Some Vessels, also Adipose Tissue.
- 33 Yes; and very adherent.

- 34 The Arachnoid, which gives to it a smooth and polished appearance.

ARACHNOID MEMBRANE.

- 35 The Serous Investment of the Spinal Cord.
 36 It is only loosely connected to the Cord.
 37 Yes.
 38 Like that of the Brain, it is inseparably united to it.
 39 Yes; and called the Sub-arachnoideal Space.
 40 Yes; by means of an Aperture in the lower boundary of the fourth Ventricle (Magendie).

PIA MATER.

- 41 The inner Investment of the Cord, which is derived from that of the Brain.
 42 Chiefly Fibrous, and less Vascular than that of the Brain.
 43 Closely.
 44 Prolongations or Folds.
 45 Yes.
 46 Ligamentum Dentatum.
 47 A Serration, hence called Ligamentum Denticulatum.
 48 About twenty.
 49 The first to the Dura Mater, opposite the margin of the Foramen Magnum; and the last, opposite the first Lumbar Vertebra.
 50 To maintain the position of the Spinal Cord.

VESSELS AND NERVES OF THE SPINAL MEMBRANES.

- 51 Yes; but not so numerous as that in the Cranium.
 52 Yes; but sparingly.
 53 No traces of their existence to the present period.
 54 Yes; the latter are supposed to be derived from the posterior Roots of the Spinal Nerves (Rcmak).
 55 Like the Brain, it is composed of Cortical and Medullary Matter, and unlike the Brain, the Grey or Cortical is surrounded by the White or Medullary Matter.
 56 Two hollow Tubes of White or Medullary Matter placed side by side, and united by Transverse Fibres of White Matter forming the Commissure.
 57 The Grey Matter, which is connected together by a Commissure of the same structure.
 58 Crescentic, with the ends of the crescent directed towards the Roots of the anterior and posterior Roots of the Nerves, and the convexity towards the middle of the Cord.
 59 Transverse Fibres derived from the opposite halves of the Medulla and the posterior Roots of the Nerves.

- 60 Of parallel Nerve Fibres, which are disposed (longitudinally) in bundles, throughout the whole length of the Cord.
- 61 From the anterior and two posterior Spinal (Branches of the Vertebral Arteries).
- 62 These small Vessels are remarkable for their length, tortuosity, and frequent inosculation with each other and with Branches from various parts of the Arterial System in the Cervical, Dorsal, and Lumbar Regions.
- 63 They open into the Petrosal Sinuses.
- 64 From the Ascending Cervical (which is a Branch of the Thyroid), Vertebral, Intercostal, Lumbar, and Lateral Sacral Arteries.
- 65 Through the Inter-vertebral Foramina.

SECTION LIV.—NEUROLOGY.

(*Neuron*, a nerve; and *logos*, a discourse.)

- 1 Into two classes—the Cerebro-Spinal and the Sympathetic.
- 2 The Nerves are the long, white, flattened Cords, which arise from the Brain and Spinal Cord, and which, like the Blood-vessels, are distributed to all parts of the body; communicating to it both sensation and motion.
- 3 They in general follow the course and distribution of the Arteries, arising in pairs and dividing into Branches.
- 4 They anastomose; in some parts they form a Plexus, in others, a knot or Ganglion from which numerous Branches are given off.
- 5 It is composed of Fasciculi or bundles of Longitudinal Fibres, closely united by Cellular Tissue, and enclosed in a Neurilemma, which is continuous with that which envelopes the Cord.
- 6 They are well supplied with Blood-vessels.
- 7 Through various Foramina situated in the base.
- 8 Nine pairs.
- 9 The Olfactory, Optic, Motores Oculorum, Pathetic, Trifacial, Abducentes, Auditory, Pneumogastric, and Lingual or Hypoglossal.
- 10 It lies in a Longitudinal Groove on the under Aspect of the anterior Lobe of the Brain, about four lines exterior to the Longitudinal Fissure.
- 11 The Olfactory Nerve arises by three Roots—an external, a middle, and an internal Root; the external or long Root arises by a long Fasciculus which passes along the Fissure of Sylvius from the middle Lobe of the

- Brain; the second or middle Root arises by a small Papilla of Grey Matter at the posterior extremity of the Groove which lodges the Nerve; and the internal or short Root arises from the Substantia Perforata at the inner extremity of the Fissure of Sylvius.
- 12 By the convergence of the three Roots the Nerve is formed, which passes forwards on either side of the Crista Galli, where it forms an enlargement on the Cribriform Plate of the Ethmoid Bone, called the Olfactory Bulb.
- 13 About twenty.
- 14 Through numerous Foramina in the Cribriform Plate.
- 15 Into three sets: an internal, middle, and external set.
- 16 To the Pituitary Membrane, lining the Septum Narium.
- 17 To the Roof of the Nares.
- 18 To the Lining Membrane of the two superior Turbinated or Spongy Bones, and the plain surface of the Ethmoid Bone before them.
- 19 The external and internal are Medullary, and the middle Root is Cineritious.
- 20 Its Branches are deficient in the White Matter.
- 21 Yes; they receive a Neurilemma Sheath from the Dura Mater and Pia Mater.

SECOND PAIR.

- 22 The Optic Nerve arises from the Optic Thalamus, Corpus Geniculatum Externum, and anterior pair of the Corpora Quadrigemina (Nates) on either side.
- 23 It first rests on the Crus Cerebri, it then passes forwards towards its fellow of the opposite side, and unites with it before the Sella Turcica, where it forms the Optic Commissure; the two Nerves then diverge and leave the Cranium through the the Optic Foramen on either side to enter the Orbit, where each pierces the Sclerotic and Choroid Coats, to terminate in the Retinal Expansion of the Eye.
- 24 Within the Circle of Willis, on the Olivary Process of the Sphenoid Bone.
- 25 The Tuber Cinereum, from which it receives Fibres.
- 26 Yes, partially; it is only the innermost Fibres which cross each other, whilst the outer Fibres of each pass directly onwards to the Eyeball of the same side.
- 27 The innermost.
- 28 That part of the Nerve anterior to the Commissure,
- 29 The external Coat of the Eyeball (the Sclerotic).

- 30 That part which is posterior to the Commissure, called the Optic Tract.
 31 The Ramus Centralis Retinæ, a Branch of the Ophthalmic.
 32 The Ophthalmic Artery.

THIRD PAIR.

- 33 The Motor Oculi arises from the inner surface of the Crus Cerebri, just before the anterior border of the Pons Varolii.
 34 It enters the Canal appropriated to it in the Dura Mater, close by the posterior Clinoid Process, it then passes forwards along the outer Wall of the Cavernous Sinus above the other Nerves (viz: the Pathetic, the Frontal, and Lachrymal Branches of the Ophthalmic), but as it approaches the Sphenoidal Fissure it lies below these Nerves, and there divides into two Branches, which enter the Orbit between the two Heads of the outer Rectus.
 35 The Muscular Nerve of the Eyeball.
 36 The superior Rectus, inferior Rectus, external Rectus, internal Rectus, Levator Palpebræ, and Obliquus Inferior.
 37 The lower or inferior Branch.
 38 The superior Rectus and Levator Palpebræ.
 39 The lower Branch, which forms its inferior Root.

FOURTH PAIR.

- 40 The fourth; Nervus Patheticus vel Trochlearis.
 41 From the Valve of Vieussens and Testis.
 42 It passes along the Crus Cerebri to the margin of the Tentorium Cerebelli, where it enters an Aperture in this Process of the Dura Mater, near to the posterior Clinoid Process; it then passes in the Cavernous Sinus along its outer Wall to the Sphenoidal Fissure, through which it enters the Orbit.
 43 It lies below the Motor Oculi.
 44 It is situated higher than the other three Orbital Nerves.
 45 To the superior Oblique Muscle.

FIFTH PAIR.

- 46 The fifth; Trifacial vel Nervus Trigemini.
 47 From the middle of the Crus Cerebelli, close to its junction with the Pons Varolii, by numerous Filaments varying from eighty to one hundred.
 48 Two distinct parts, one of which is continuous with the Fibres of the anterior Column of the Spinal Cord, communicating motion; the other, continuous with

the Fibres of the posterior Column, communicating sensation.

- 49 The two Roots pass into the middle Fossa of the base of the Cranium through an Aperture in the Dura Mater, near the extremity of the Petrous Bone, the larger or posterior of these Roots then forms a Plexus of a semilunar shape, called the Gasserian Ganglion, whilst the smaller or anterior Root passes beneath the Ganglion and unites with one of the three Branches which this Ganglion gives off, viz, the inferior Maxillary Nerve.
- 50 In a small Depression on the extremity of the Petrous Bone.
- 51 The Ophthalmic, superior Maxillary, and inferior Maxillary.

OPHTHALMIC NERVE.

- 52 It enters the Orbit through the Sphenoidal Fissure.
- 53 The Frontal, Lachrymal, and Nasal.
- 54 The Frontal Branch.
- 55 The Supra-orbital Foramen.
- 56 Yes; the Supra-trochlear Branch and the Supra-orbital Branch, which latter is the continuation of the Frontal Nerve.
- 57 The Lachrymal.
- 58 Between the two Heads of the outer Rectus Muscle.
- 59 The anterior Ethmoidal Foramen.
- 60 On reaching the side of the Crista Galli it passes on the Cribriform Plate, where it descends into the Nose through an Aperture in the front of the last-named Bone, and divides into two Branches—an internal and an external Branch, the former ramifying in the Pituitary Membrane, and the latter distributed to the Integuments of the Wing and extremity of the Nose.
- 61 The Ganglionic, long Ciliary, and Infra-trochlear.
- 62 By the Ganglionic Branch of the Nasal.
- 63 Two and sometimes three, which are given off by the Nasal as it crosses the Optic Nerve.
- 64 After piercing the posterior part of the Sclerotic Coat they pass between it and the Choroid to the Iris, to which they are distributed.
- 65 From the Nasal, just before this Nerve leaves the Orbit through the anterior Ethmoidal Foramen.
- 66 A Filament from the Supra-trochlear Nerve.
- 67 To the upper Eyelid, Lachrymal Sac, Caruncula Lachrymalis, Conjunctiva and Root of the Nose.
- 68 A Sensory Nerve.

SUPERIOR MAXILLARY NERVE.

- 69 In the Gasserion Ganglion.
- 70 It passes forwards, leaving the Cranium through the Foramen Rotundum of the Sphenoid Bone, it then crosses the Spheno-maxillary Fossa to the Infra Orbital Foramen, through which it passes, to be distributed to the Eyelid, Nose, Face, Upper Lip, &c.
- 71 These, according to some Anatomists, (Wilson), are arranged in three sets, viz., those given off in the Spheno-maxillary Fossa, those in the Infra-orbital Canal, and those on the Face.
- 72 The Orbital; two to Meckel's Ganglion, and the posterior Dental.
- 73 The Spheno-maxillary Fissure.
- 74 Two Branches, Malar and Temporal, the former supplying the Integument of the Cheek, and the latter, the side of the Head.
- 75 The Facial, Temporal and anterior Auricular.
- 76 The middle and anterior Dental Branches.
- 77 The Muscular and Cutaneous Branches
- 78 Branches of the Facial Nerve which form an intricate Plexus, called the Infra-orbital Plexus.
- 79 A small Branch to the lower Eyelid, (Palpebral.)
- 80 The Muscular and Cutaneous Branches supply the Muscles and Integuments of the Cheek, Nose, and Upper Lip.
- 81 A Sensory Nerve.

INFERIOR MAXILLARY NERVE.

- 82 The inferior Maxillary, which is the last of its three divisions.
- 83 From the Gasserion Ganglion.
- 84 Through the Foramen Ovale of the Sphenoid Bone.
- 85 Into two Primary Branches; an anterior or Motory, and a posterior or Sensory.
- 86 The external Pterygoid Muscle.
- 87 The anterior and posterior Temporal, Masseteric, internal Pterygoid and Buccal Branches.
- 88 To the Temporo-maxillary Region.
- 89 The Auriculo-Temporal, inferior Dental and Gustatory.
- 90 Two to the Meatus Auditorius, the anterior Auricular Branch, Parotid, and one or two Branches which communicate with the Facial and Sympathetic.
- 91 It first descends between the internal and external Pterygoid Muscles, it then passes between the former

Muscle and the Ramus of the inferior Maxilla over the internal Lateral Ligament to the inferior Dental Foramen, and runs along its Canal to the Mental Foramen in the side of the Jaw, where it terminates by dividing into two Branches, an Incisive and Mental (or Labial?) Branch.

92 The Mylo-hyoid.

93 It descends between the internal and external Pterygoid Muscles to the side of the Tongue, where it divides into numerous Filaments which are distributed to the Mucous Membrane and to the two smallest kinds of Papillæ, viz: Papillæ Conicæ et Fungiformes.

94 A connecting Branch of the Facial, viz: the Chorda Tympani, which accompanies the Gustatory to the Submaxillary Gland (where it furnishes an offset to the Submaxillary Ganglion) and to the Tongue.

95 Principally the Papillæ of the Tongue.

96 A compound Nerve, possessing both Motory and Sensory Functions; analogous to the anterior and posterior Roots of the Spinal Nerves.

SIXTH PAIR.

97 The Nervus Abducens arises from the upper part of the Pyramidal Body where it joins the Pons Varolii.

98 Advancing to the Dura Mater, which it perforates on the Basilar Process of the Sphenoid Bone, it ascends to the Cavernous Sinus, along the inner Wall of which it runs in company with the internal Carotid Artery, it then passes forwards to the Sphenoidal Fissure where it enters the Orbit, between the two heads of the outer Rectus Muscle.

99 The external Rectus, by its two or three terminal Branches.

100 The Ophthalmic Vein lies immediately below it.

101 One or two Filaments from the Sympathetic Nerve (the Carotid Plexus) and a Filament sometimes from the Ophthalmic Nerve.

102 A Motor Nerve.

SEVENTH PAIR.

103 It commences in the lowest part of the Pons Varolii, near to the Corpus Restiforme.

104 Yes; consisting of two portions, viz., Portio Mollis, vel Auditory and Portio Dura vel Facial.

105 From Lineæ Transversæ in the Floor of the fourth Ventricle and the Corpus Restiforme.

- 106 To the internal Ear.
- 107 The Cochlear and Vestibular.
- 108 The Special Nerve of Hearing.
- 109 The Facial.
- 110 From the Lateral Tract of the Spinal Cord, between the Olivary and Restiform Bodies, close to the lower border of the Pons Varolii.
- 111 The Aqueduct of Fallopius.
- 112 The Stylo-Mastoid Foramen.
- 113 It passes forwards within the Parotid Gland and crosses the external Carotid Artery and external Jugular Vein to the Ramus of the Lower Jaw.
- 114 The posterior Auricular, the Digastric, and the Stylohyoid.
- 115 The Temporo-facial and the Cervico-facial.
- 116 Temporal, Malar, and Infra-orbital Branches.
- 117 To the side of the Head and upper half of the Face.
- 118 By the Infra-orbital or Facial Branches of the superior Maxillary Nerve, communicating with the terminal Branches of the Infra-orbital Branch of the Facial.
- 119 The Buccal, Supra Maxillary and Infra Maxillary.
- 120 To the lower half of the Face and upper part of the Neck.
- 121 Sympatheticus Minor.
- 122 Auditory, Glosso-Pharyngeal and two Branches from the fifth.
- 123 The Auditory, Petrosal Branch of the Vidian, and a Filament from the Otic Ganglion.
- 124 Glosso-Pharyngeal and Par-Vagum.
- 125 A small Filament from the ascending Branch of the anterior Auricular, also terminal Branches from the Auricularis Magnus and Occipitalis Minor.
- 126 The Supra and Infra Orbital, one of the terminal divisions of the Orbital, viz., the Temporo Malar, also the Buccal and Labial from the inferior Maxillary and the Superficialis Colli from the Cervical Plexus.
- EIGHTH PAIR.
- 127 Three portions, viz., the Glosso-pharyngeal, Pneumogastric and Spinal Accessory.
- 128 The Glosso-pharyngeal.
- 129 It arises by three or four Filaments from the Sulcus or Respiratory Tract between the Corpus Olivare et Restiforme and close to the Facial Nerve.
- 130 The Jugular Foramen.

- 131 To the Tonsils, Pharynx and Tongue.
- 132 The upper is called the Jugular Ganglion (Ganglion Superius vel Jugulare of Müller), and the lower, the Petrosal Ganglion (Ganglion Inferius vel Petrosum of Andersch).
- 133 The Petrosal Ganglion.
- 134 The Sympathetic, a Filament to the Auricular Branch of the Pneumogastric, and the Facial.
- 135 The Tympanic (or Nerve of Jacobson), Pharyngeal, Lingual, Tonsillitic, and Muscular.
- 136 The Pneumogastric Nerve.
- 137 It arises by eight or nine Filaments from the Sulcus or Respiratory Tract, just below the Glosso-pharyngeal Nerve.
- 138 The Jugular Foramen, in a distinct Sheath of the Dura Mater.
- 139 The Ganglion of the Root (Ganglion Superius).
- 140 The Ganglion of the Trunk (Ganglion Inferius).
- 141 To the Spinal Accessory, Sympathetic, one to the Ganglion Inferius of the Glosso-pharyngeal, and the Auricular Branch.
- 142 The Hypo-glossal, also Branches to the upper Ganglion of the Sympathetic and to the two first Cervical Nerves.
- 143 The superior Laryngeal, and its external Branch—the Pharyngeal, the inferior Laryngeal or Recurrent Branch, Cardiac Branches, Muscular, Oesophageal, Pulmonary (anterior and posterior), and the Terminal Filaments of the Vagus, viz : the Gastric.
- 144 The Pharyngeal Plexus, by Communicative Branches from the Glosso-pharyngeal, superior Laryngeal, and Sympathetic.
- 145 To the Muscles, and the Pharyngeal Mucous Membrane between the Tongue and Os Hyoides.
- 146 Some Cardiac and Muscular Branches.
- 147 By Communicative Branches from the Sympathetic (its Great Cardiac Plexus.)
- 148 By Communicative Branches from the Sympathetic (its Great Cardiac Plexus.)
- 149 Plexus Gulæ.
- 150 To the Stomach, Omentum, Pancreas, Spleen, Liver, and Gall-bladder.
- 151 Yes; especially the right Vagus Nerve.
- 152 This Nerve consists of two parts—Accessory and Spinal; the Accessory portion arises by a few Filaments

- from the side of the Spinal Cord, as low as the first Cervical Nerve; the Spinal portion arises by several Filaments from the lateral surface also of the Spinal Cord commencing opposite the fourth Cervical Vertebra.
- 153 It unites with the Vagus just below its superior Ganglion, or Ganglion of the Root, in the Jugular Fossa by one or two Filaments, but the greater part of it becomes blended with the Vagus outside the Jugular Foramen, below the inferior Ganglion, or Ganglion of the Trunk.
- 154 Some small Filaments to the Pharyngeal and superior Laryngeal Branches of the Vagus.
- 155 It passes, external to the Foramen, backwards behind the internal Jugular Vein, and perforates the Sternomastoid Muscle; it then crosses the Neck obliquely to the Trapezius Muscle, to which and to the Sternomastoid it is distributed.

NINTH PAIR.

- 156 The Motor Nerve of the Tongue, supplying its Muscular Structure.
- 157 By eight or nine Filaments from the Sulcus between the Corpus Pyramidale and Corpus Olivare.
- 158 Two Bundles or Fasciculi which pierce the Dura Mater separately, and unite into one Nerve as soon as it has escaped from the Cranium through the anterior Condylloid Foramen.
- 159 It passes forwards between the internal Carotid Artery and internal Jugular Vein, it then descends the Neck into the anterior triangular space, where it passes inwards to be distributed to the Muscles of the Tongue.
- 160 The Vagus, Sympathetic, Spinal Accessory, and the first two Spinal or Cervical Nerves.
- 161 Descendens Noni, and a small Filament to the Thyrohyoideus Muscle.
- 162 The former lies in the centre of the Tongue, whilst the Gustatory lies near its border.
- 163 Chiefly in its Papillæ.
- 164 Into four Sets or Groups: Sensory, Motor, Respiratory, and Spinal.
- 165 Olfactory, Optic, and Auditory.
- 166 Motor Oculi, Abducens, and Lingual.
- 167 Pathetic vel Trochlear, Facial, and Glosso-pharyngeal (which are the Respiratory Nerves of Sir C. Bell), and the Vagus and Spinal Accessory.

- 168 The Trifacial vel Trigemini, which is analogous to a Spinal Nerve, possessing both Motory and Sensory functions, and the existence of a Ganglion (the Gasserion) on the larger or posterior Root.

SECTION LV.—SPINAL NERVES.

- 1 Thirty-one pairs.
- 2 By two Roots: an anterior or Motor, and a posterior or Sensory Root.
- 3 From the White or Medullary portion on the anterior Columns.
- 4 From the Grey or Cineritious portion on the posterior aspect of the Cord.
- 5 A Ganglion.
- 6 External to the Ganglia.
- 7 A Spinal Nerve.
- 8 Through the Intervertebral Foramina, the first and last excepted.
- 9 They each divide into two Branches—anterior and posterior; the former distributed to the front part of the body, and the latter to the posterior part of the body.
- 10 Into four Sets or Groups: Cervical, Dorsal, Lumbar, and Sacral.

CERVICAL NERVES.

- 11 Eight pairs.
- 12 Horizontally.
- 13 Between the Occipital Bone and Atlas or first Vertebra (the Sub-occipital).
- 14 Between the last Cervical and first Dorsal Vertebra.
- 15 It forms a loop by uniting with an Ascending Branch from the second Cervical Nerve.
- 16 Some to the Vagus, Lingual, and Sympathetic.
- 17 To the Complexus, Rectus Anticus Major et Minor, Obliquus Superior et Inferior.

CERVICAL PLEXUS.

- 18 By the anterior Primary Branches of the four upper Cervical Nerves.
- 19 At the upper part of the Neck on the middle Scalenus, Levator Anguli Scapulæ, and Splenius Muscles, and beneath the Sterno-mastoid and Platysma Muscles.
- 20 Into two Sets: Superficial and Deep.
- 21 Into Ascending and Descending Branches.
- 22 Superficial Cervical (or Superficialis Colli), great Auricular, and smaller Occipital Branch.

- 3 It divides beneath the *Platysma Myoides* into a Descending and an Ascending Branch, which are distributed to the *Platysma* and to the Integument on the side and front of the Neck, towards the Chin, also the lower part of the Face.
- 24 By Branches from the second and third Nerves of the Cervical Plexus.
- 25 It divides into Auricular, Mastoid, and Facial Branches.
- 26 From the second Cervical Nerve of the Plexus.
- 27 Acromial and Clavicular.
- 28 From the third and fourth Nerves of the Cervical Plexus.
- 29 To the Integuments on the upper and anterior part of the Chest from the Sternum to the Shoulder.
- 30 These are the Phrenic, Muscular, and Communicating Branches.
- 31 By the third and fourth Branches of the Cervical Plexus, and sometimes joined by a Branch from the fifth Cervical Nerve.
- 32 To the Diaphragm (its under surface).
- 33 No; the left is the longest, owing to the position of the Heart.
- 34 Two; one derived from the second, and the other from the third, Nerve of the Plexus.
- 35 These Branches, derived from the Loop between the two first Nerves of the Plexus are distributed to the *Trapezius*, *Levator Anguli Scapulæ*, *Rhomboidei*, and *Rectus Anticus Major* Muscles.
- 36 The Sympathetic and contiguous Abdominal Plexuses.

POSTERIOR CERVICAL PLEXUS.

- 37 By the frequent communications of the posterior Primary Branches of the first or Sub-occipital Nerve with the second and third Cervical Nerves.
- 38 Between the *Complexus* and *Semispinalis Colli* Muscles.
- 39 Muscular, Cutaneous, and the greater Occipital Nerve.
- 40 To the *Sterno-mastoid*, *Levator Anguli Scapulæ*, *Trapezius*, and middle *Scalenus* Muscles.
- 41 To the Neck and Scalp (on their posterior Aspect).
- 42 The largest Cutaneous Nerve at the back of the Head, to which it is distributed by numerous Offsets, and forms the continuation of the second Cervical Nerve.
- 43 To the Muscles and Integument in the posterior part of the Neck (Cervical) and upper Dorsal Region.

SECTION LVI.—BRACHIAL OR AXILLARY PLEXUS.

- 1 By the union of the anterior Primary Branches of the four lower Cervical Nerves with the first anterior Primary Dorsal Nerve.
- 2 From the lowest part of the Neck to the Axilla.
- 3 Three; the first is formed by the union of the fifth and sixth Nerves near the Vertebrae; the second by the seventh Nerve; and the third, by the union of the last Cervical and first Dorsal Nerve, beneath the anterior Scalenus Muscle.
- 4 By the union of the seventh Nerve or second portion with that formed by the fifth and sixth Nerves.
- 5 One is formed by the union of the fifth, sixth and seventh Nerves; and the other, as just stated, by the last Cervical and first Dorsal Nerves.
- 6 Between the two Scaleni Muscles.
- 7 It is placed at first to the outer side, and afterwards behind the Artery.
- 8 According to one class of Anatomists, into those situated above the Clavicle and those below it; according to another class, into Humeral and Descending Branches
- 9 The Nerves of this Set which terminate chiefly in the Muscles of the lower part of the Neck, and in those of the Chest and Shoulder are—a Branch to the Phrenic, one to the Subclavian Muscle, one to the Rhomboid Muscle, one to the Serratus, viz: the long posterior Thoracic, vel Expiratory of Sir C. Bell; Branches to the Scaleni and Longus Colli Muscles, and a Supra-scapular Branch to the Dorsum of the Scapula.
- 10 From the fifth Cervical Nerve.
- 11 From the Trunk or Cord formed by the fifth and sixth Cervical Nerves.
- 12 The two short or anterior Thoracic, the Median, Musculo-cutaneous (vel external Cutaneous), the internal Cutaneous, the lesser internal Cutaneous vel Nerve of Wrisberg, the Ulnar, Subscapular, Circumflex, and Musculo-spiral Branches.
- 13 One of the the anterior Thoracic Nerves (the external), the external Cutaneous, and the outer Head of the Median Nerve.
- 14 The inner anterior Thoracic, internal Cutaneous, the lesser internal Cutaneous, the inner Head of the Median, and the Ulnar Nerve.

- 15 The Subscapular, Circumflex, and Musculo-spiral.
- 16 To the Muscles on the front of the Chest, to some of the Scapular Muscles, the Latissimus Dorsi, and to those of the Upper Extremity.
- 17 Yes; with one exception—the first Intercosto-humeral, which is derived from the second Intercostal Nerve, and which supplies the inner and posterior surfaces of the upper half of the Arm.
- 18 The Median Nerve.
- 19 Muscular Branches of the Ulnar Nerve.
- 20 By two Roots from the Brachial Plexus; one from the outer and the other from the inner Cord.
- 21 The Axillary Artery.
- 22 It lies at first to the outer side of the Brachial Artery as low as the insertion of the Coraco-brachialis, it then crosses over the Vessel about the middle of the Arm, and descends along its inner side to within two inches of the Elbow-joint, it then passes between the two Heads of the Pronator Radii Teres and Flexor Sublimis Digitorum, down the Forearm, between the Flexor Sublimis and Profundus, and as it emerges from under the Annular Ligament, it divides into two parts (which again subdivide), one part supplying the Muscles of the Thumb, and the other part two Fingers and a half, viz: the Radial side of the Index Finger, the adjoining sides of the Index and Middle Fingers, and the adjoining sides of the Middle and Ring Fingers.
- 23 The Abductor and Opponens Pollicis.
- 24 Five.
- 25 Muscular, anterior Interosseous, and Cutaneous Branches.
- 26 It leaves the outer Cord of the Plexus in common with the outer Head of the Median Nerve, opposite the lower border of the Pectoralis Minor Muscle, and pierces the Coraco-brachialis; it then passes between the Biceps and Brachialis Anticus to the outer side of the Limb, near to the Elbow; it then pierces the Fascia of the Arm and divides into two Branches, which are distributed to the outer part of the Forearm and to the anterior and posterior surfaces of the Wrist.
- 27 Yes, to Muscles in front of the Humerus, viz: Coraco-brachialis, Biceps, and Brachialis Anticus.
- 28 This Nerve arises from the inner Cord of the Plexus in common with the Ulnar and inner Head of the Median, and is the smallest of its Branches; it passes super-

- ficially down the inner side in company with the Basilic Vein to about the middle of the Forearm, where it perforates the Fascia, and divides into two Branches, these again subdivide, to be distributed to the Integuments at the inner and forepart of the Forearm to the Wrist.
- 29 The Vein lies over it.
- 30 They communicate with the Musculo-cutaneous and Ulnar Nerves.
- 31 This long and delicate Nerve which arises just below the preceding Nerve, descends upon its inner side to the space between the Olecranon Process and inner Condyle of the Humerus, where it pierces the Fascia and is distributed to the Integument on the posterior Aspect of the Joint; some few of its Twigs are also distributed to the Integument on the inner and anterior surface of the Arm.
- 32 This Nerve also arises from the inner Cord of the Plexus; it descends along the inner side of the Arm, and passes in the Groove between the inner Condyle of the Humerus and the Olecranon Process, and enters the Forearm between the two Heads of the Flexor Carpi Ulnaris; it then descends along the inner side of the Forearm, over the Annular Ligament to the Palm of the Hand, where it divides into two Branches—a Superficial and Deep Palmar Branch; the Superficial first supplies some small Filaments to the Palmaris Longus, and then terminates in three Branches—one to the Ulnar side of the Little Finger, one to the adjoining sides of the Little and Ring Fingers, and a Connecting Branch to the Median Nerve; the Deep Palmar Branch is distributed to the Muscles of the Little Finger, and to the Lumbricales and Interossei on the Palmar surface.
- 33 It lies to the inner side of the Artery.
- 34 None.
- 35 Muscular, Articular, Cutaneous, and Dorsal Branches.
- 36 Three.
- 37 From the posterior Cord of the Plexus; the first or upper Branch supplies the Subscapularis Muscle; the second or lower also supplies the Subscapularis, and terminates in the Teres Major; and the third or long Branch terminates in the Latissimus Dorsi.
- 38 In the Circumflex and Musculo-spiral Nerves.

- 39 It passes round the border of the Subscapularis Muscle, and behind the Neck of the Humerus, where it divides into numerous Branches which supply the Muscles particularly the Deltoid, Teres Major et Minor, and Latissimus Dorsi, also the Integument; it also supplies an Articular Branch to the under surface of the Shoulder Joint.
- 40 It descends from its origin in front of the Tendons of the Teres Major and Latissimus Dorsi Muscles, it then winds with the superior Profunda Artery around the Humerus to the outer part of the Arm, beneath the Triceps Muscle; it then descends between the Brachialis Anticus and Supinator Longus Muscles to the outer Condyle of the Humerus, in front of which it divides into two Branches—the Radial and posterior Interosseous Nerves.
- 41 Muscular and Cutaneous Branches.
- 42 To the Triceps, Supinator Longus, Extensor Carpi Radialis Longior, and Anconeus Muscles.
- 43 This Nerve, the largest of the two Divisional Branches into which the Musculo-spiral divides, passes in front of the outer Condyle of the Humerus along the outer or Radial side of the Forearm to its lower third, under cover of the Supinator Radii Longus, and divides about two inches above the Wrist (where it becomes Cutaneous) into two Branches—an external and an internal; the former supplying the outer border of the Hand and that of the Thumb; and the latter the opposite or Ulnar Border of the Thumb, the Radial side of the Index Finger, and the adjoining sides of the Index and Middle Fingers.
- 44 The Musculo-cutaneous and Dorsal Branch of the Ulnar Nerve.
- 45 It lies to the outer side of the Artery.
- 46 The Tendon of the Supinator Radii Longus.
- 47 This Nerve, the other Divisional Branch of the Musculo-spiral, separates from the Radial Nerve in front of the outer Condyle, and winds backwards through the Supinator Radii Brevis, and lies between the Superficial and Deep Layers of Muscles on the posterior Aspect of the Forearm, as far as its middle part, where it divides into Branches for their supply.
- 48 The Dorsal Aspect of the Carpus, where it forms an enlargement, from which numerous Filaments are

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distributed to the Wrist Joint, viz: to the Ligaments and Articulations of the Carpus.

- 49 Yes; with three exceptions in the Superficial Layer—the Anconeus, Supinator Radii Longus, and the long Extensor of the Wrist, viz: Extensor Carpi Radialis Longior.

SECTION LVII.—DORSAL NERVES.

- 1 Twelve pairs.
- 2 The Intervertebral Foramina.
- 3 The first between the first and second Dorsal Vertebrae, and the last between the last Dorsal and first Lumbar.
- 4 Yes; one is called a Dorsal, and the other an Intercostal Nerve.
- 5 Directly backwards, between the Transverse Processes and divide each into a Muscular and Musculo-cutaneous which are distributed to the Dorsal Muscles and Integuments.
- 6 The anterior Primary Branches of the Dorsal Nerves.
- 7 Twelve.
- 8 Horizontally forwards in the Intercostal spaces (except the last which is below the last Rib), and accompany the Intercostal Vessels, each lying below the Vein and Artery.
- 9 Some Sympathetic Filaments from the adjoining Ganglia.
- 10 Its distribution is the same, but differs from them from the circumstance of its not being situated in an Intercostal Space, being below the last Rib.
- 11 A Muscular and a Cutaneous Branch.
- 12 Into two: a Lateral and an anterior Cutaneous Branch; the former divides into anterior and posterior Filaments for the supply of the Integuments of the antero-lateral and lateral parts of the Trunk.
- 13 About midway between the Vertebral Column and the Sternum.
- 14 Each Intercostal Nerve is continued onwards to the side of the Sternum, where it terminates as the anterior Cutaneous Nerve of the Thorax.
No such Plexus exists.
- 15 No.
- 16 Each gives off an Intercosto-humeral Branch.
- 17 It perforates the outer Intercostal Muscle of the second Intercostal Space, and divides into two Branches—an external and internal; the former communicates

with the lesser internal Cutaneous Nerve, and ends in Filaments, which are distributed to the inner and posterior surface of the Arm to the Elbow; and the latter, to the Integument of the Armpit and inner side of the Arm.

- 18 It perforates the outer Intercostal Muscle of the third Intercostal Space, between the Indigitations of the Serratus Magnus, and divides into Filaments which supply the Integument of the Shoulder.
- 19 Larger, and does not divide like the others, it perforates the external Oblique Muscle, crosses over the Iliac Crest, and supplies the Integument over the Gluteal Region.

SECTION LVIII.—LUMBAR NERVES.

- 1 Five pairs.
- 2 The first, between the first and second Lumbar Vertebrae; and the last, between the last Lumbar and base of the Sacrum.
- 3 To the Muscles of the Lumbar Region and Integument over the Sacrum, forming frequent communications with each other.
- 4 Like the posterior Dorsal, into Muscular and Musculo-cutaneous, and distributed as just described.
- 5 By loops of communication between the anterior Primary Branches of the four upper Lumbar Spinal Nerves.
- 6 In the substance of the Psoas Magnus Muscle.
- 7 The Musculo-cutaneous, external Cutaneous, Genito-crural vel external Pudic, anterior Crural vel Femoral, and Obturator.
- 8 Two Branches—superior and inferior; the former is called the Ilio-scrotal vel Inguinal Branch, and the latter the Ilio-hypogastric Branch.
- 9 This Branch arises from the first Lumbar Nerve and passes between the posterior Fibres of the outer border of the Psoas Magnus Muscle, its upper part; it is then directed across the Quadratus Lumborum to the front of the Crest of the Ilium where it perforates the Transversalis Abdominis Muscle and divides into two Branches, an Abdominal and Scrotal Branch, the former is distributed to Rectus and internal Oblique, also the Integument of the Abdomen, the latter escaping at the external Abdominal Ring, is distributed in the Male to the Scrotum, and in the Female to the

- external Labia, also to the upper and inner part of the Thigh.
- 10 This Branch also arises from the first Lumbar Nerve, and like the preceding, is directed over the Quadratus Lumborum to the crest of the Ilium, where it enters the Wall of the Abdomen, by perforating the Transversalis Abdominis Muscle, and gives off two Branches an Iliac and Hypogastric Branch; the former supplying the Integument of the Gluteal Region, and the latter (which sometimes escapes through the external Abdominal Ring) supplying the Integument (as its name implies) of the Abdominal Parietes of the lower Region.
 - 11 This Branch arises from the second Nerve of the Lumbar Plexus; it perforates the middle of the outer border of the Psoas Muscle, and passes obliquely over the Iliacus Muscle to the space between the anterior Iliac Spinous Processes, and quits the Abdomen into the Thigh beneath Poupart's Ligament, it then pierces the Fascia Lata, and divides into two Branches— anterior and posterior, which are distributed to the corresponding surfaces on the outer Aspect of the Limb.
 - 12 This Branch also arises from the second Nerve of the Lumbar Plexus, also from the communicating loop between this Nerve and the first, it then pierces the Psoas Magnus, and running down its anterior surface to near Poupart's Ligament divides into two Branches, a Genital and Crural, the former supplying the Cord and Cremaster in the Male, and round Ligament in the Female, and the latter or Crural Branch escapes below Poupart's Ligament and supplies the Integument on the anterior aspect of the Thigh, its upper half.
 - 13 This Branch, the largest of the Lumbar Plexus, arises from the second, third and fourth Nerves, appears from beneath the Psoas Muscle, and passing downwards between it and the Iliacus, escapes from the Abdomen into the Thigh beneath Poupart's Ligament and divides into several Branches.
 - 14 Yes, some Muscular Twigs to the Psoas and Iliacus Muscles.
 - 15 These are superficial and deep; the superficial consists of three Branches viz: the internal and middle Cutaneous and the long or internal Saphenous Nerve; the

- deep or Muscular set supplies all the Muscles on the front of the Thigh, the Tensor Vaginæ Femoris excepted.
- 16 To the Integument along the inner side of the Thigh.
 - 17 To the Integument in front of the Thigh as far as the Knee.
 - 18 From its origin to the middle of the inner border of the Foot, and supplies Branches to the Integument on the inner side of the Leg and Foot to the Great Toe.
 - 19 In the Thigh it takes the course of the Femoral Vessels, thus entering the Sheath of the Femoral Artery it accompanies that Vessel along its outer side to the Aperture in the Adductor Magnus Muscle, it then leaves the Artery, passing between the Tendons of the Sartorius and Gracilis Muscles to the upper part of Leg where it becomes Cutaneous, it then descends along the inner side of the Leg in company with the internal Saphenous Vein to the Foot.
 - 20 Yes, two; one communicating Branch to the internal Cutaneous and Obturator in the Plexus, and the other an Articular Branch to the Knee Joint; it also supplies a Patellar Branch.
 - 21 The inner Branch which supplies the inner surface of the Foot and Great Toe.
 - 22 This Nerve arises from the third and fourth Nerves of the Lumbar Plexus, it passes downwards beneath the Psoas Muscle to the inner border of the Pelvis along which it passes to the upper part of the Obturator or Thyroid Foramen where it joins the Obturator Artery, having escaped through this Aperture into the Thigh it divides into four Branches, three of which supply the Adductor Brevis, Adductor Longus, Pectineus and Gracilis, and the posterior Branch, the Adductor Magnus.
 - 23 By the union of the fifth or last Lumbar Nerve with a connecting Branch from the fourth Nerve of the Lumbar Plexus.
 - 24 The Sacral Plexus.

SECTION LIX.—SACRAL NERVES.

- 1 Five and sometimes Six Pairs.
- 2 Like the other Spinal Nerves into anterior and posterior Branches.
- 3 Through the Apertures in front of the Sacrum, with the exception of the fifth Nerve which escapes between the Sacrum and Coccyx.

- 4 Through the Apertures in the back of the Sacrum, with exception of the fifth Nerve which issues between the Sacrum and Coccyx.
- 5 No; the first two are large and the last two small.
- 6 The posterior.
- 7 They form frequent communications with each other, and supply the Muscles and Integument in the Sacral and Gluteal Regions.
- 8 They receive short Filaments from the Ganglionated Cord of the Sympathetic.
- 9 Into two parts.
- 10 The Hypogastric and Sacral Plexuses.
- 11 The Viscera and surrounding Muscles, and joins the fifth Sacral Nerve.
- 12 The Bladder and Vagina.
- 13 These Branches, three in number, supply the Levator Ani and Coccygeus, also the Integument around the Anus.
- 14 No; they are chiefly distributed to the Muscles in this Region, viz: the Sphincter Ani and Coccygeus.
- 15 The Sacral Plexus.
- 16 The Pudic Nerve.

SACRAL PLEXUS.

- 17 By the union of the Sacro-Lumbalis Nerve with the first three anterior Primary Sacral Nerves and part of the fourth anterior Primary Sacral Nerve.
- 18 Triangular, and situated on the Pyriformis Muscle.
- 19 The Pelvic Fascia.
- 20 Into two sets, internal and external; the former are Visceral and Muscular.
- 21 To the Rectum and Bladder, and in the Female to the Vagina also.
- 22 They supply within the Pelvis, the Pyriformis, and Obturator Internus, they also supply an Hæmorrhoidal Branch to the Sphincter Ani and Integument.
- 23 Muscular, superior Gluteal, Pudic, and the small and great Sciatic.
- 24 To the two Gemelli, Pyramidalis, Quadratus Femoris and Capsule of the Hip Joint.
- 25 From the Sacro-Lumbalis Nerve.
- 26 It passes out of the Pelvis through the great Ischiatic Foramen with the Gluteal Artery, where it divides into two Branches for the supply of the two smaller Gluteal Muscles (Gluteus Medius et Minimus) and the Tensor Vaginæ Femoris.

- 27 This Nerve arises from the lower part of the Sacral Plexus as it is about to pass from the Pelvis through the great Ischiatic Foramen below the Pyriformis Muscle, it then takes the course of the internal Pudic Artery, through the small Ischiatic Foramen, where it gives off the inferior Hæmorrhoidal and a large Perineal Branch, the former supplying the Sphincter Ani and Integument and the latter the Perinæum; the internal Pudic then passes forward along the Perinæum, pierces the triangular Ligament of the Urethra to reach the Dorsum of the Penis in company with the Dorsal Branch of the Pudic Artery, where it terminates in numerous Branches which supply the Corpus Cavernosum, Integuments of the Dorsum, the sides and Prepuce of the Penis.
- 28 Yes; superficial Perineal Branches (anterior and posterior) also some Muscular Branches to the under surface of the Erector Penis, the transverse Perinei, Accelerator Urinæ; it also gives off a long delicate Filament which ramifies in the Corpus Spongiosum Penis.
- 29 The Clitoris, also the parts about the Perineum and the Vulva.
- 30 From the lower part of the Sacral Plexus.
- 31 It leaves the Pelvis through the great Ischiatic Foramen below the Pyriformis Muscle, and follows the course of the Sciatic Artery as far as the lower border of the Gluteus Maximus Muscle, it then passes down the posterior part of the Thigh and Popliteal Region beneath the Fascia, and terminates in the Integument in the posterior part of the Leg (the middle of the Calf.)
- 32 Into Muscular and Cutaneous.
- 33 These Branches, (sometimes called the inferior Gluteal) supply the Gluteus Maximus.
- 34 To the superficial Fascia of the lower part of the Gluteus Maximus and the Integument of the inner side and posterior aspect of the Thigh.
- 35 This Cutaneous Branch, which is derived from the lesser Ischiatic Nerve, is distributed to the Genital Organs.
- 36 The Labium.
- 37 This Nerve, the largest in the Body, is formed by the Sacral Plexus, in fact, it appears to be a continuation of the Sacral Plexus.
- 38 After escaping from the Pelvis through the great Ischiatic

Foramen beneath the lower border of the Piriformis Muscle, it descends into the hollow between the Great Trochanter and Tuberosity of the Ischium to about the middle of the posterior part of the Thigh, where it divides into its two Terminal Branches—the internal and external Popliteal.

- 39 Yes, Muscular and Articular; the former supplying the Biceps, Semimembranosus, Semitendinosus, and Adductor Magnus Muscles, and the latter, the Knee-joint.
- 40 This Nerve passes from the division of the Greater Ischiatic Nerve, through the middle of the Popliteal Space at the back of the Leg, to the lower border of the Popliteus Muscle, where it becomes the posterior Tibial Nerve.
- 41 Yes; some Articular Offsets to the Knee-joint, some Muscular Branches to the two Heads of the Gastrocnemius, to the Soleus, Plantaris, and Popliteus Muscles, and a large Cutaneous Branches to the Leg and Foot—the external Saphenous Nerve, which is sometimes called the Communicating Tibial; this Nerve supplies the outer side of the Foot and Little Toe, and sometimes the adjoining side of the fourth Toe.
- 42 This Nerve lies along the outer boundary of the Ham; it descends by the side of the Biceps Tendon, crossing the inner Head of the Gastrocnemius and origin of the Soleus Muscle, to the Head of the Fibula, just below which it perforates the Fibres of the Peroneus Longus Muscle, and divides into two Branches—anterior Tibial and Musculo-cutaneous.
- 43 Yes; Cutaneous, Muscular, and Articular Branches.
- 44 To the Integument in the upper half of the outer side of the Leg.
- 45 Yes; this Branch communicates with the external Saphenous or Communicating Tibial of the internal Popliteal Nerve.
- 46 To the upper part of the Tibialis Anticus.
- 47 This Nerve, which is a continuation of the internal Popliteal, proceeds from the lower border of the Popliteus Muscle along the posterior aspect of the Leg to the space between the Os Calcis and inner Ankle, where it divides beneath the Annular Ligament into the internal and external Plantar Branches of the Foot.
- 48 It lies to the outer side of the Artery.
- 49 Yes; some Muscular and Cutaneous Branches.

- 50 To the deep Flexors on the posterior Aspect of the Leg.
- 51 To the Integument on the inner and under part of the Heel.
- 52 The internal.
- 53 That of its Artery, between the Flexor Brevis Digitorum and Abductor Pollicis, and divides opposite the bases of the Metatarsal Bones into four Digital Branches, which supply both sides of the three inner Toes and the inner side of the fourth Toe, similar to the Digital Branches of the Median Nerve.
- 54 No; the inner Branch to the Great Toe is undivided, whilst the others Bifurcate at the Clefts.
- 55 Yes; Muscular, Cutaneous, and Articular.
- 56 Like the internal Plantar Nerve, it follows the course of its Artery, and supplies the two remaining Digital Branches—one of which is undivided and supplies the outer border of the Little Toe, and the other, which Bifurcates at the Cleft, supplies the adjoining sides of the two outer Toes, similar to the Digital Branches of the Ulnar Nerve.
- 57 In the Deep Layer of Muscles of the Sole of the Foot.
- 58 According to some Anatomists, into two Sets—a Superficial and Deep; the former supplying the Digital Branches, and the latter accompanying the Arch of the external Plantar Artery, supplies most of the Interossei, the Transversalis Pedis, and the two outer Lumbricales Muscles, and terminates internally in the Adductor Pollicis Muscle.
- 59 Yes; to the Integument of the Sole and outer border of the Foot.
- 60 The last Digital Branch of the internal Plantar Nerve.
- 61 This Nerve, which commences at the Bifurcation of the external Popliteal or Peroneal Nerve just below the Head of the Fibula, courses inwards beneath the Extensor Longus Digitorum to reach the outer side of the anterior Tibial Artery near the middle of the Leg, and follows the course of this Vessel along the Foot (Dorsalis Pedis Artery) to the first Interosseous Space, where it terminates on the surface by distributing Branches to the adjoining sides of the great and second Toes.
- 62 Yes, Muscular and Articular; the former supplying in the Leg the Tibialis Anticus and Extensor Longus Digitorum, and, on the Dorsum of the Foot, a Tarsal

- Branch to the Extensor Brevis Digitorum, also the Interossei.
- 63 This Nerve, which forms the other division of the external Popliteal or Peroneal Nerve, commences just below the Head of the Fibula, descends between the Extensor Longus Digitorum and Peronei Muscles to the lower third of the Leg, where it perforates the Fascia, and divides into two Peroneal Branches—inner and outer; the former supplying the inner side of the Foot and the Great Toe; and the latter, which divides into three Branches, and these again subdivide to supply the adjoining sides of the four outer Toes.
- 64 The internal Saphenous (from the anterior Crural) and anterior Tibial.
- 65 The external Saphenous or Communicans Tibialis of the internal Popliteal.
- 66 Yes; some Muscular Twigs to the Peronei Muscles.

SECTION LX.—SYMPATHETIC SYSTEM.

- 1 This Nerve, which consists of a series of Ganglia on each side the Vertebral Column, extends from the Head to the Coccyx.
- 2 It communicates with all the other Nerves of the Body.
- 3 All the internal Organs and Viscera of our Fabric.
- 4 From the fourth and sixth Nerves in the Cavernous Sinus.
- 5 As soon as they have escaped from the Cranium and Spinal Canal, the fourth and sixth excepted.
- 6 At their terminations or final expansions.
- 7 They accompany them to the various Organs and form around them, from their frequent communications, Plexuses, *e.g.* Carotid, Cervical, Pharyngeal, Lumbar Plexus, &c.
- 8 To facilitate their description they may be divided into three parts: superior, middle, and inferior; the first comprising the Cervical and Cranial; the second, the Thoracic; and the third, the Abdominal Region.
- 9 The Ophthalmic, Ciliary or Lenticular Ganglion, the Spheno-palatine or Meckel's Ganglion, the Ganglion of Ribes, and the Otic or Arnold's Ganglion.
- 10 This Ganglion, formed by the union of Branches from the Sympathetic, is situated within the Orbit, its posterior part, between the Optic Nerve and outer Rectus Muscle, and external to the Ophthalmic Artery.

- 11 These are Distributive and Communicative; the former or Ciliary Branches proceed from the anterior part of the Ganglion, and are divided into two Fasciculi—an upper and a lower; the former composed of about four Filaments, and the latter of five or six Filaments, they accompany the Ciliary Arteries, and divide into numerous Branches which perforate the Sclerotic Coat around the Optic Nerve, and are distributed to the Coats of the Eyeball.
- 12 These, three in number, are—a long Ciliary Filament from the Nasal Branch of the Ophthalmic Nerve; a short Filament to the inferior division of the third or Motor Nerve; and a long Filament to the Cavernous Plexus.
- 13 Somewhat roundish and flattened, of a reddish-brown colour, and about the size of a pin's head.
- 14 Sensory, Motor, and Sympathetic; the Sensory derived from the Nasal Branch of the fifth, the Motor from the inferior division of the third, and the Sympathetic from the Cavernous Plexus.
- 15 The Spheno-palatine or Meckel's Ganglion.
- 16 In the Spheno or Pterygo-maxillary Fossa.
- 17 Into ascending, descending, anterior and posterior, or inwards and backwards.
- 18 These two, and sometimes three, small Filaments ascend through the Spheno-maxillary Fissure into the Orbit, and communicate with the Optic Nerve.
- 19 These Filaments, three in number,—large, small, and external—descend through the posterior Palatine Foramen, and are distributed as follows: the large or anterior Palatine Branch to the Mucous Membrane and Glands of the Roof of the Mouth, that of the Nose (its middle and lower Spongy Bones) and Soft Palate; the small or posterior Palatine Branch to the Soft Palate, Uvula, and Tonsil; and the external or smaller Palatine Branch to the Velum Palati and Tonsil.
- 20 These Branches, four or five in number, pass through the Spheno-palatine Foramen, and supply the Mucous Membrane of the Nares, viz: the superior Nasal Branch and the Naso-palatine or Nerve of Cotunnus.
- 21 These Branches, two in number, are the Pharyngeal and the Vidian; the Pharyngeal Branch passes through the Pterygo-palatine Canal, and supplies the Lining Membrane of the Pharynx.

- 22 This Nerve passes backwards from Meckel's Ganglion, through the Pterygoid or Vidian Canal to the Foramen Lacerum Basis Cranii, and divides into two Branches—the Carotid and Petrosal; the former enters the Carotid Canal to join the Plexus of the same name; and the latter passes into the Cranium through the Foramen Lacerum Basis Cranii, and backwards in a Groove on the anterior surface of the Petrous part of the Temporal Bone to the Hiatus Fallopii, where it unites with the Gangliform expansion on the Facial Nerve, the Petrosal Branch then enters the Tympanum, which it crosses and assumes the name of the Chorda Tympani.
- 23 From the circumstance of its joining the Facial it is a Compound Nerve—Motor and Sympathetic.
- 24 A Branch from the Tympanic Nerve.
- 25 Through the medium of the Petrosal Branch of the Vidian.
- 26 Sensory, Motor, and Sympathetic; the Sensory derived from the fifth Nerve; the Motor, from the Facial, through the Vidian; and the Sympathetic proceed from the Carotid Plexus.
- 27 On the inner surface of the inferior Maxillary Nerve or third Branch of the Ophthalmic, between it and the Eustachian Tube, and just below the Foramen Ovale.
- 28 These are Distributive and Communicative; the former supplying the Tensor Tympani and Tensor vel Circumflexus Palati Muscles and the latter are Filaments to the Motor Root of the third Branch of the Ophthalmic, to the Auricular, to the Facial, the Petrosal Branch of the Vidian, and to the Sympathetic Plexus on the middle Meningeal Artery.
- 29 Motor, Sensory, and Sympathetic, as described in the preceding answer.
- 30 On the anterior Communicating Artery (which unites the two anterior Cerebral Arteries.)
- 31 By the union of the Sympathetic Filaments which accompany the ramifications of the two anterior Cerebral Arteries.
- 32 The Ganglion of Ribes.
- 33 In the anterior or Naso-palatine Canal; its existence as a Ganglion has been doubted.
- 34 These are Distributive and Communicative; the former supplying the anterior part of the Palate; the latter

- are two Filaments which terminate on either side in Meckel's Ganglion.
- 35 This small Ganglion is situated in the Submaxillary Gland.
- 36 Of a reddish-brown colour, and about the size of a pin's head.
- 37 These are Distributive and Communicative; the former supplying the Gland and its Ducts, also the Mucous Membrane of the Mouth; and the latter by Filaments to the Gustatory, the Chorda Tympani of the Facial through its Petrosal Branch, and the Sympathetic Filaments on the Facial Artery,
- 38 The Carotid and Cavernous Plexuses.
- 39 On the outer side of the Carotid Artery at its entrance into the Cavernous Sinus.
- 40 The sixth Nerve.
- 41 The continuation of the Carotid Plexus onwards by the side of the Pituitary Fossa of the Sphenoid Bone, constitutes by its frequent loops of communication the Cavernous Plexus.
- 42 The third, fourth, and fifth Nerves.
- 43 The Carotid Plexus.
- 44 The third, fifth, seventh, and eighth.

CERVICAL GANGLIA.

- 45 On either side the Spinal Column.
- 46 Three: superior, middle, and inferior.
- 47 The superior Cervical Ganglion.
- 48 Fusiform, of a reddish-grey colour, and extends from between three and four lines beneath the base of the Skull to opposite the lower border of the third Cervical Vertebra.
- 49 Into Distributive and Communicative.
- 50 To the Blood-vessels (Branches of the external and internal Carotid Arteries, Nervi Molles), the Pharynx, Larynx, and the superior or superficial Cardiac Nerve, sometimes called Superficialis Cordis.
- 51 These are both Spinal and Cerebral; three, and sometimes four upper Spinal Nerves communicate with the Ganglion; and the Cranial Nerves, the Pneumogastric, Hypo-glossal, and Glosso-pharyngeal communicate by Filaments with this Ganglion.
- 52 Three on either side—superior, middle, and inferior.
- 53 This Ganglion, sometimes called Thyroid Ganglion, is

- situated opposite the fifth Cervical Vertebra; this Ganglion is not always present.
- 54 Into Distributive and Communicative.
- 55 To the Thyroid Gland or Body, and the Heart.
- 56 The external Branch of the superior Laryngeal and the inferior or Recurrent Laryngeal Nerves.
- 57 The middle or Great Cardiac Nerve.
- 58 The superior Cardiac and the inferior Laryngeal Nerves.
- 59 The fifth and sixth Cervical Nerves.
- 60 This Ganglion, sometimes called the Vertebral Ganglion, from its situation, is placed upon the Root or base of the Transverse Process of the last Cervical Vertebra, and internal to the superior Intercostal Artery.
- 61 Only one—the inferior Cardiac Nerve.
- 62 It unites with the inferior Laryngeal Nerve, and terminates in the deep Cardiac Plexus, behind the Aortic Arch.
- 63 To the last two or three Cervical Nerves; other Branches accompany the Vertebral Artery in its Canal, and form a Plexus on this Artery—the Vertebral Plexus.

CARDIAC PLEXUSES.

- 64 By the union of the middle and inferior Cardiac Nerves, and by Branches from the Vagus Nerve.
- 65 On the Bifurcation of the Trachea, behind the Aortic Arch.
- 66 Yes.
- 67 By Filaments from the superior Cardiac Nerves, the Cardiac Ganglion, and the Great Cardiac Plexus.
- 68 By numerous Filaments (which accompany the right Coronary Artery to the Heart) derived from the anterior Cardiac Plexus.
- 69 By numerous Filaments (which accompany the left Coronary Artery to the Heart) derived from the Great Cardiac Plexus.

THORACIC GANGLIA.

- 70 Twelve on either side.
- 71 On the Heads of the Ribs in the Intercostal Spaces.
- 72 The first.
- 73 The Pleuræ Costales.
- 74 Branches to the Spinal Nerves and to the Viscera.
- 75 Generally two; these are called the external Branches, and communicate with each Spinal or Intercostal Nerve.
- 76 Into two Sets; the Branches of the upper five or six, which are very small, are distributed to the Aorta,

Vertebræ, and their Ligaments; and the lower Ganglia, which are larger, unite to form the two Visceral Nerves of the Abdomen, viz: the Splanchnic Nerves.

- 77 From the Branches of four or five Dorsal Ganglia, sixth to the tenth.
- 78 It descends in front of the bodies of the Vertebræ, and pierces the outer border of each Crus or Pillar of the Diaphragm to terminate in the Semilunar Ganglion of the Abdomen.
- 79 By Filaments from the tenth and eleventh Dorsal Ganglia, and pierces each Crus of the Diaphragm, to terminate in the Cæliac Plexus; a Branch from the last Ganglion, called the smaller Splanchnic Nerve, perforates the Diaphragm and terminates in the Renal Plexus; this Nerve is not always present.

ABDOMINAL GANGLIA.

- 80 The Semilunar Ganglia.
- 81 One on either side the Cæliac Axis close to the Renal Capsule.
- 82 By its union it forms a Ganglionic Circle, from which Branches issue in all directions.
- 83 The Epigastric or Solar Plexus.

SOLAR PLEXUS.

- 84 The Great Splanchnic Nerves, some Filaments from the small Splanchnic Nerves, and some Terminal Twigs from the right Par Vagum.
- 85 To all the Viscera of the Abdomen above the Pelvis.
- 86 Plexus.
- 87 The Phrenic, Hepatic, Cæliac, Mesenteric, Renal, Supra-renal, and Spermatic.
- 88 The Gastric, Hepatic, and Splenic.
- 89 From the Aortic and Renal Plexuses.
- 90 From the left part of the Aortic Plexus.

LUMBAR GANGLIA.

- 91 Four, and sometimes five.
- 92 Along the inner border of the Psoas Muscle, and in front of the bodies of the Lumbar Vertebræ.
- 93 Into Distributive and Communicative.
- 94 Indirectly to the Viscera.
- 95 Two Plexuses—the Aortic and the Hypogastric.
- 96 Some from the Solar and superior Mesenteric Plexuses.
- 97 In the Hypogastric Plexus.
- 98 In front of the upper part or Promontory of the Sacrum, between the two common Iliac Arteries.
- 99 It divides into two parts, which are distributed to the

Branches of the internal Iliac Artery, and to all the Pelvic Viscera.

- 100 These Branches, two in number from each Ganglion, communicate with the Ganglion above and below.
- SACRAL GANGLIA.
- 101 Four, and sometimes five.
- 102 On the front of the Sacrum on the inner side of its Sacral Foramina.
- 103 The Lumbar Ganglionated Cord.
- 104 Inferiorly the two Cords unite by means of a Loop anterior to the Coccyx.
- 105 A small Ganglion, called Ganglion Impar vel Azygos.
- 106 Like the Ganglion of Ribes, which connects the Sympathetic Cord superiorly, this Ganglion forms the bond of union of the Sympathetic Cord on either side inferiorly.
- 107 Like the Lumbar, into Distributive and Communicative; the former are distributed to the Pelvic Viscera, they also communicate with the lateral prolongations of the Hypogastric Plexus.
- 108 Inferior Hæmorrhoidal, Vesical, and Prostatic; and in the Female, Ovarian, Vaginal, and Uterine.
- 109 These Branches, two in number from each Ganglion, communicate with the Ganglion above and below.
- 110 The former System is that by which sensations are received and spontaneous motions performed; hence called the Nervous System of Animal life, whilst the Nerves of the latter (the Sympathetic) are closely connected with the Nutritive Processes—being distributed to the Digestive and Secretory Organs, and to the Heart and Blood-vessels, hence called the Nervous System of Organic life (Carpenter).

CORRIGENDA.

- Page 28, Answer 24—for "Vertebræ" read "Vertebra."
 " 42, " 109—for "Secundii" read "Secundi."
 " 43, " 129—for "Flexus" read "Flexor."
 " 151, " 369—read "One-and-a-half inch."
 " 165, " 37—for "Nasem" read "Nasum."

VOL. I.

- " 141, Question 50—omit "which are derived from" and read "called the Ovarian Arteries."
 " 149, " 14—is omitted: "What is the name given to the Nutrient Vessels of the Veins?"

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